CONTEXTUAL STUDENT DIFFERENCES AND SCORING PATTERNS OF THE MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE (MSLQ)

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Sir Isaac Newton once wrote , “If I have seen further than other men, it is because I have stood on the backs of giants.” Like Newton, my success has more to do with the people who have helped me along the way than any individual effort I could have made on my own. Even in my darkest hours, someone seemed to be there, offering a word of encouragement or a helping hand. To my wife Kristen and my mother Jean, thank you for your patience and support; to Dr. Pettibone, who from the very start insisted on excellence, and to many more, too numerous to name, thank you—we made it.

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CHAPTER 1

INTRODUCTION

Motivation and Study Skills as Predictors of Academic Success

Few academic intervention programs have been successful at helping low socioeconomic and/or minority background students overcome academic barriers without addressing the motivational underpinnings that make students successful in academia (Allen, 1999). In short, how little or how much a student values what he or she learns can and does greatly influence how much and how long a student will stay on the task of learning (Astin, 2003).

Because of higher education's emphasis on an autonomous learning environment, many notable researchers (Tremblay, 1999) hold that an individual's motivation is a major factor in his or her ability to succeed in college and ultimately persist to degree completion. One definition of motivation is that it is the force that determines behavior (Tinto, 1993). More precisely, motivation can be described as a combination of biological, emotional, and social forces that activate and direct behavior (Allen, 1999). These forces act as influencers that guide our day-to-day actions. However, many motivational theories developed over the past 30 years describe only one hypothetical construct or another of motivation and exclude other, relevant factors (Tremblay).

Although single construct theories are useful and predictive in nature, the internal or external forces motivating the individual student often vary from circumstance to circumstance and thus, such theories fail to acknowledge the entire playing field of

motivation (Tremblay, 1999). To compound the problem of accurate assessment and measurement, prior research suggests that some of the motivational inventories based upon single theoretical constructs such as goal orientation, self efficacy, attribution, and intrinsic-extrinsic theories have proven to be less successful at accurately predicting academic outcomes for some sampled minority populations (Carey, 2000). Despite many researchers' efforts, none have developed a single theoretical construct that explains the total motivational domain (Heckhausen & Dweck, 1998; Tremblay).

Why this Study Needed to be Conducted

Many studies to date have looked at the relationship between motivation and academic success for "general population" (predominantly white, middle and high income) students (Carey, 2000). Many more studies have established relationships between economic background, academic achievement as measured by GPA, and persistence to degree completion (Tinto, 1993). Although several studies identify one or more low income student populations as high risk in terms of not completing their educational goals (Pascarella, Pierson, Wolniak, Terenzini & Patrick, 2004), Pintrich (2004) points out that few studies explore the potentially profound role socioeconomic background may play in a student's academic interests, motivation, and problem-solving ability, all of which influence persistence. It may be as Beegle (2002) holds, that low income students have value systems that are so markedly different from the value systems held by middle to high income students, that the factors which naturally make some students perform to their best potential are overlooked by those capable of effecting change. The reason for this may be that the collegium themselves are also members of the middle to high income group and thus share that value system.

Pintrich (2004) points out that conducting a cross-comparative study of the mean scores of differing cultural or socioeconomic groups might lead to a better understanding of the role played by culture and/or socioeconomic background as to determining motivation and use of certain study skills methods. Research in this area could lead to both a better understanding of how to structure intervention programs for struggling students, and a means of helping academicians better understand how to shape the college classroom learning environment to reach at-risk students. If significant differences exist between successful motivational patterns and learning strategies among student groups, then a cross-comparative study using an instrument such as the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia & McKeachie, 1991) could allow comparisons of multiple single motivational and learning theories as applied to student groups with differing socioeconomic backgrounds. The information gained could give what Pintrich (2004) calls a "tool kit" to those who seek to help students in need of additional assistance.

Prior research suggests that validity and reliability problems may exist with many instruments based upon single constructs (Carey, 2000). Instruments based upon constructs such as self-efficacy (Bandura, 2002) and intrinsic motivation (Reeve, Nix & Hamm, 2003) have not proven as generalizable (Carey, 2000) when applied to some minority populations. It would be useful to ascertain if the MSLQ (Pintrich et al., 1991) shares some of the same problems as other unidirectional instruments regarding accurate predictions of success or failure for low income student populations.

Purpose of the Study

The purpose of this study was to first re-establish factorial validity of the MSLQ,

assess its predictive strength for low, middle and high income students, and then evaluate if academically successful motivational and study skills profiles differ along income and ethnic lines.

Factor analysis methodology was conducted to test for factor validity among the economic subgroups – low income students, middle income students and high income students. Factor analysis methodology was used to check the MSLQ's validity for any meaningfully numbered ethnic populations participating in the study. Further analysis of variance methods was conducted to ascertain if significantly different successful motivational and/or study strategy profiles exist within the MSLQ along economic and/or ethnic lines. The 15 different MSLQ subsections served as the independent variables and the students' end of semester GPA served as the first dependent variable. Cumulative college GPA served as the second dependent variable.

Overview of the MSLQ

The MSLQ (Pintrich et al., 1991) is a self-report instrument designed to assess college students' motivational orientations and their use of different learning strategies. Based on a general cognitive view of motivation and of learning strategies (Pintrich et al.), the MSLQ consists of two sections, a motivational section and a learning strategies section (Pintrich et al.). The motivation section consists of 31 items that evaluate students' academic goals and values, their beliefs about their ability to succeed in a course, and their anxiety about tests in a course. There are 31 items in the learning strategy section; all of them concern students' use of different cognitive and metacognitive learning strategies. The learning strategies section also includes 19 items regarding the students' management of academic resources.

Study Limitations

Although the MSLQ is a peer reviewed instrument (Benson, 1998), it lacks the validity and reliability follow-up studies needed to ascertain the generalizability of the instrument. The original validation studies for the MSLQ are now over 12 years old (Pintrich et al., 1991; Pintrich & Smith, 1993). To date, no other comprehensive study has been published to confirm or debunk the MSLQ's generalizability. Logic dictates that a study reviewing the MSLQ's validity and reliability is necessary before conducting meaningful additional, mean score cross-comparison studies designed so that strong comparison data between different student groups can be obtained.

Further, it would be helpful if data from multiple schools could be combined to create a large enough sample size to defeat some of the reliability issues inherent in the original normed MSLQ sample (Benson, 1998). Prior research (Pintrich, 2004) suggests that problems with generalizability to larger populations past the institutional level exist because of the inherent instability associated with testing differing populations in differing settings. Pintrich et al. (1991) and Pintrich (2003) maintain the more global the sample taken with the MSLQ, the less generalizable the results will become. Pintrich's (2003) conclusion indicates prior research that sought to merge data from a multiple school study only served to deteriorate the internal and external validity of the instrument past the point of significance. Although other studies have successfully administered the MSLQ to larger student populations within a single institution (Talbet, 1994), at present the MSLQ testing guide only maintains the MSLQ's strong generalizability within a

given class (Pintrich et al.). For instance, the original normed sample contained a campus-wide class sample with multiple student majors and yielded significant but weak scale correlations to end of semester GPA (Pintrich et al.).

Pintrich and Smith (1993) established validity and reliability information for the MSLQ with a sample population size of 380 students. Benson (1998) suggests that sample sizes of less than 380 students would most likely yield weaker results. Benson also contends that the reliability of the internal consistency estimates in the original sample should be higher. Internal consistency estimates ranged from .62 to .93 for the motivational scales and .52 to .80 for the learning strategies scales (Benson). It is hoped this new study will yield stronger results. If the results of the first portion of this study do not yield stronger data than the original study (Pintrich & Smith, 1993), further cross-comparisons of the low income, middle income and high income student subpopulations will most likely suffer.

Chapter Summary

Attempting to determine a student's motivation to be academically successful and his or her use of certain study skills methodologies may be the best predictor of college achievement and thus persistence to degree completion. Such a determination may have particularly helpful implications for students from low income backgrounds who have traditionally not performed as well academically as their middle and high income counterparts. When given to a student group whose socioeconomic data is also captured as part of the study, the MSLQmay provide a means to determine the link between motivation and the use of certain learning strategies and academic success as measured by GPA for low income students. Conversely, the study may prove that traditional

conceptions of motivation, and/or the use of certain study skills, are not significant predictors of academic success for low income populations. The MSLQ should be administered at one institution to a sample population of approximately 380 students in order to obtain the most reliable data.

CHAPTER 2

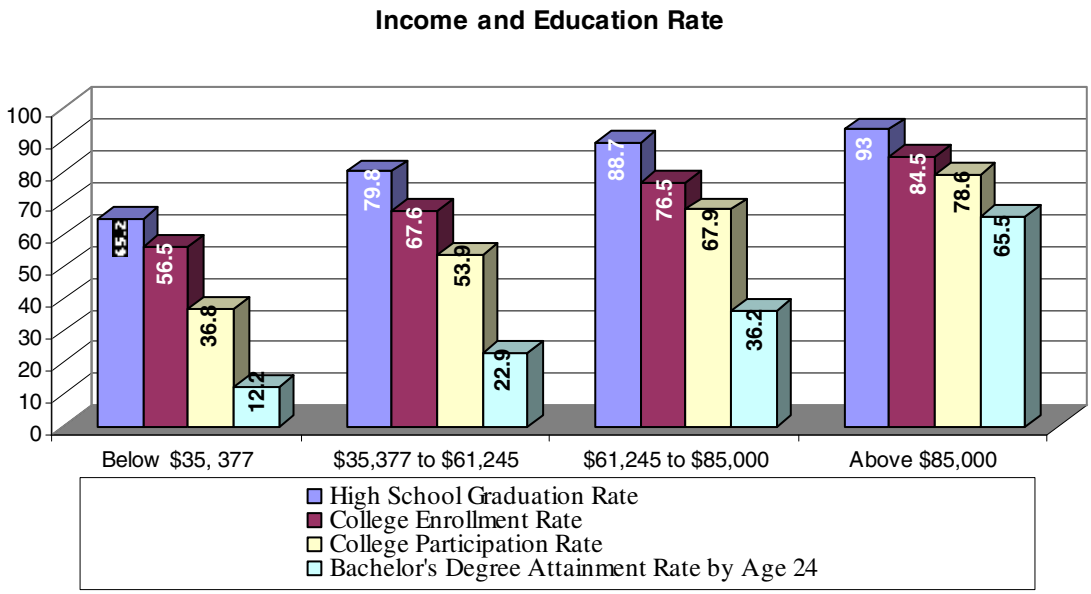
REVIEW OF LITERATURE

Socioeconomic Background Plays a Role in Academic Success

Most people would like to believe we live in a world where everyone has an equal chance of success. Although we may have been created equal, few can effectively argue that the income and cultural background of the student's family do not play a significant role in that student's chances of obtaining a college degree. For instance, Mortenson (2004) points out that only 12.2 percent of children from families whose yearly earnings place them in the lowest income quartile (those with gross family incomes of $35,377 or less) earn a bachelor's degree before the age of 24. In stark contrast, 65.5 percent of the children from families in the top income quartile (those with gross family incomes above $85,000) obtain bachelor's degrees before the age of 24. This data was summarized in Figure 1.

Figure 1

Estimated Bachelor's Degree Attainment by Age 24



Based upon 2002 U.S. Census information and U.S. Department of Education data

Economic Barriers to Academic Success for Students from Diverse Ethnic Backgrounds

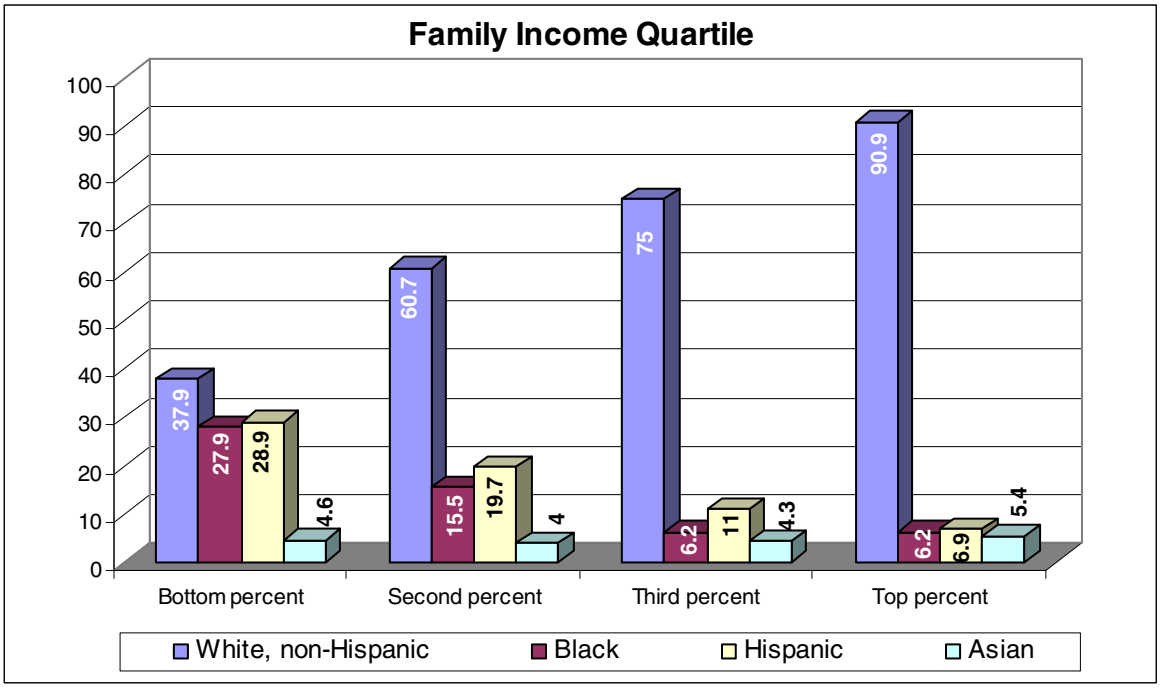
Although progress has been made in the 50 years since *Brown v. Board of Education*, Gurin, Lehman and Lewis (2004) point out that most students of color still lag far behind their white counterparts in academic performance and achievement (Flowers & Pascarella, 2003). Recently the Supreme Court, in *Gutter v. Bollinger,* acknowledged the relationship between race and academic success was strong enough to warrant ruling in favor of allowing continuation of many of the affirmative action programs currently in place at the University of Michigan (Guerin et al.).

According to Mortenson (2004), students from ethnically diverse backgrounds are

generally distributed across four family income quartiles. Mortenson points out that most students who are members of the three largest minority groups—Hispanic, African American and Asian American—are heavily concentrated in the bottom half of the income distribution and are likely found in the bottom quartile. Mortenson (2004) conveys the fact that 60.9 % of 18 to 24 year olds with the bottom quartile identified themselves as being from a minority background. Thirty eight percent of the second quartile was made up of students who identified themselves as minority students. Twenty two point seven percent of the third quartile was minority students, whereas in the top quartile, only 17.9 % of students identified themselves as being from a minority background. This data is summarized in Figure 2.

Figure 2

Breakdown of Students from Different Minority Groups by Family Income Quartile



In contrast, although those students who identify themselves as white made up roughly 38% of the lowest income quartile—the largest group percentage identified- the second, third and highest income quartiles are made up of even higher percentages of white students and consecutively lower percentages of each identified minority group.

Significant Growth Expected in Number of Low Income Students Attending College

The U.S. Department of Education (National Center for Educational Statistics, 2004) estimates the traditional college age population (18-24) will increase by 16%, or 2.6 million, between 2000 and 2015. According to the National Assessment of Educational Progress (2003), over 80% of the expected increase in new students will be from low income backgrounds, with nearly half of the increase coming from Latino populations. National Assessment of Educational Progress goes on to point out that these student populations suffer the most from cultural, financial, and academic barriers to higher education.

Perception of Colleges and Universities as Gatekeepers to the Middle and Upper Classes

For well over a century, many in this country have considered common education as the best means of balancing many of society's social ills (Kolodny, 1998; Tyack & Cuban, 1999). Although the need for primary and secondary education is as great as ever, today a college degree is, for most practical purposes, the standard gateway for entry into the middle and upper classes. Melvin and Stick (2001) hold that many people now see higher education as the great equalizer, facilitating equal opportunity for employment and thus for economic prosperity. The Department of Education often reinforces this rationale by widely publicizing that a college graduate will most likely earn three times more in their lifetime than a person who graduated with only a high school degree (National

Center for Educational Statistics, 2004). The income gap is even larger when comparing non-graduates with students holding advanced degrees.

Mortenson (2004) indicates the watershed repercussions to society for the future are that low income and/or historically challenged ethnic groups will continue to maintain their present economic status. The need to include more students in the educational process is vital to the economy (National Assessment of Educational Progress, 2003). The Department of Education (National Center for Educational Statistics, 2004) reported that, given the nation's ongoing conversion from an industrial to an information technology-based economy, the percentages of students participating or not participating in the educational process could have a significantly negative impact on the nation's economy.

Probable Causes of Low Academic Success Experienced by Many Low Income Students

No single cause can explain the lower success rates experienced by students from low income families. Indeed, as one wades into the literature that surrounds the issue, one quickly realizes that the culpability is more likely systemic than individualized to the student. For instance, research often concludes that federal and state governments have been negligent in offering adequate financial assistance to students from low income backgrounds (Melvin & Stick, 2001). Other research concludes that campus environments are not hospitable enough, often making students from underrepresented groups feel unwelcome or unincluded, and thus increasing the stress and anxiety these students experience during the transition to college life (Tinto, 1993). Still others conclude the learning environment created within higher education's predominant reliance on memorization skills fostered by the lecture method of teaching leads many

students to disengage and ultimately question the value of what is being taught to them (Pascarella et al., 2004). However, Allen (1999) indicates the variance cannot be completely explained if one only considers the external forces that either hinder or support a student's progress. At some point, the student himself or herself is responsible for his or her own learning.

Although the author of this study recognizes that external forces (those influencers outside of the classroom) have a profound effect on classroom performance, the focus of this study will limit itself to the responsibility of the student as a learner and to the sphere of influence the student can effectively control. Given that only 54% of the students who start college ever finish and that a strong high school GPA accounts for less than 12% of the variance when correlated to college graduation rates, it is apparent that academic ability is not the only cause of student departures and much more of the variance is still left unexplained (Tinto, 1993). Significantly, less than 25% of all students who leave college before completing a degree do so because they were academically forced to do so (Tinto, 1993).

Pascarella et al. (2004) observe that some students seem to adjust more swiftly to changing situations and are better able to handle the academic and social pressure of college than others. Those that do not persist, Pascarella et al. state, are in most cases as academically strong as their persisting classmates but tend to be less mature, less emotionally stable, and less flexible and adaptive to the new circumstances that higher education has to offer. Further, Zea and Reisen (1997) point out that a disproportionately high percentage of students of color come to campus with less academic preparation than their white counterparts. Astin (2003) holds that not every student--majority or minority,

underrepresented or overrepresented, male or female—comes to college equally prepared and not all students learn the same way.

Role of Economic Realities and Learned Coping Behaviors in Academic Success

The value system developed by a student's family to deal with the reality of their individual economic circumstances may be a telling predictor of academic success. From this perspective one could argue that the value systems developed by families from high income backgrounds will mesh with the value systems generally espoused by the collegium (Beegle, 2000). Students from minority groups traditionally caught in the bands of poverty have the added pressure of replacing old systems that are less functional within the college culture with more functional systems (Pascarella et al., 2004). For some, becoming academically successful - as defined by GPA and persistence to degree completion - means changing value and behavioral patterns often held by their peers and/or immediate family members (Tinto, 1993).

Role of Motivation in Academic Success

Few academic intervention programs have been successful at helping students from low socioeconomic and/or minority backgrounds overcome academic barriers without first addressing the values and motivational underpinnings that make any student successful in academia (Allen, 1999). In short, how little or how much a student values what he or she learns can and does greatly influence how much and how long a person will stay on the task of learning (Tinto, 1993).

Even though the role of motivation in learning and academic performance has been the focus of many studies in educational psychology, Heckhausen and Dweck (1998) hold that motivation is a very broad and vague concept that is not often well suited

to a single hypothetical construct. Over the years, many theorists have nibbled around the edges of what is often commonly described as motivation (Tremblay, 1999), but none have developed a fully encompassing theory that illustrates motivation's many different facets. Following this argument, Snow and Jackson (1994) and Tremblay (1999) demonstrate existing measures of motivation are usually limited to a few constructs and adhering to one measure but not another could run the risk akin to a blind man describing an elephant.

Although useful and predictive in nature, the internal or external forces motivating the individual student tend to vary from circumstance to circumstance (Tremblay, 1999). To compound the problem, some of the motivational inventories based upon single theoretical constructs such as self efficacy, attribution, and intrinsic-extrinsic are less successful at accurately predicting academic outcomes for some minority populations than for majority populations (Carey, 2000). Despite researchers' efforts, none have developed a single theoretical construct that explains the total motivational domain (Heckhausen & Dweck, 1998; Tremblay).

Motivation as Predictor of Academic Success

For educational purposes, individual commitments, whether expressed as motivation, drive, or effort, prove to be centrally related to staying or leaving college. Tinto states it is obvious a person's willingness to work for the attainment of their goals is an important part of the process of persistence to degree completion. Conversely, the lack of willingness or commitment proves to be a critical part of the exodus process. This author holds that students with a high academic competence and moderate to high goal commitment are most likely to persist, whereas students with high competence but only

moderate to low commitment tend to transfer to other colleges or stop out and re-enroll at a later time. Individuals with low competence but with moderate to high commitment tend to persist in college unless forced to leave because of failing grades. However, Tinto goes on to point out that those students with both low competence and moderate to low commitment were most likely to drop out altogether and not re-enroll in any other college even at a later date (Tinto, 1993).

Link between Motivation and Student Retention

A recent study by Allen (1999) offered measures linking motivation to persistence. In his study, Allen examined the structural relationships among four constructs: motivational factors, student background, academic performance and persistence of first year students. Allen concluded that background variables play a strong role in persistence and that a desire to finish college influences persistence.

Motivation Can Be Influenced

Pintrich (2003) writes that motivational research is often split into two camps. The first generally holds that motivation is a constant, largely unmovable driver throughout one's life (Brown, 1997). Through this lens, one can offer little hope for those who either wish to better themselves or for instructors who seek to structure their classroom environments to enhance learning performance through motivation. Researchers indicate that while motivation may be situated, contextual influencers such as economic background or ethic identity can have a profound impact on how one's motivational domain is formed (Kitayama, 2002; Pintrich, 2003; Tangney & Leary, 2003). Kitayama says a mistake is commonly made when one considers motivation as a constant, unidirectional entity that is either better or worse, less or more. Instead,

Kitayama holds that much more can be understood if one considers motivation as something formed to meet the differing demands of one's environment.

Zea and Reisen (1997) offer more quantitative evidence that agrees with Tinto (1993) and Astin (2003), that institutions can affect attrition indirectly through GPA by teaching skills that promote theoretical motivational links such as self-efficacy and causal attribution and by teaching students information-processing skills through classes and programs that emphasize selecting main ideas, self-testing strategies, time management, and concentration skills. Zea and Reisen also found GPA has a direct effect on attrition, and ACT scores, information processing, selecting main ideas, self-testing, time management and concentration all have indirect effects on attrition through GPA. Zea and Reisen also found only motivation was related to both GPA and retention. Zea and Reisen show that in higher education presently most programs are focused on skills development instead of on motivation. In contrast, in the private sector, most interventions focus almost exclusively on motivation.

Need for Better Method of Assessment

Perhaps there is a hybrid approach that faculty would find useful in addressing the problem of retention of low income students. Allen (1999) hints that further research is needed to discern between those students who are headed for the door no matter what we do and those who, with a few institutional accommodations, could develop into strong enough college students to ultimately graduate and move on to become productive alumni.

Pintrich (2003) concludes instruments need to be developed to effectively measure student motivation and to determine if there are differences in motivation along

ethnic lines and if so, what these differences are. It may be that enough common ground exists between the groups that methodologies can be designed to strengthen the development of all students. Markus and Kitayama (1991) conclude, if common ground can be found, then research in this area could lead to a more meaningful dialogue on how, why, and when academic expectations should be imposed for the benefit of all. Astin (1999) suggests that incorporating teaching methods that lead to a deeper understanding and comprehension of course material should lead to greater understanding and learning for all.

Combining Individual Theoretical Constructs

Recently, efforts have been made to combine individual theoretical constructs in one assessment instrument in an effort to capture a larger percentage of the explainable motivational variance (Tremblay, 1999). The Motivated Strategies for Learning Questionnaire (MSLQ) is one of the most recent peer-reviewed instruments that seeks to measure multiple motivational constructs (Pintrich et al., 1991). It is designed to assess college students' motivational orientations and their use of different learning strategies (Benson, 1998).

Chapter Summary

The National Assessment of Educational Progress holds that society has high expectations for Higher Education's role in aiding students from low income backgrounds to break into the middle and upper classes. Higher Education will be hard-pressed to meet these expectations as the number of low income students attending college increases. Higher Education is hard-pressed to meet these expectations now, and it is unclear why. It is likely that present assessment methods do not capture the

information needed to determine what motivates this population of students to be academically successful. Capturing such information, through an instrument such as the MSLQ, could aid Higher Education in developing methods likely to increase the academic success of low income students, and perhaps others as well (National Assessment of Educational Progress, 2003).

CHAPTER 3

METHODOLOGY

Purpose of the Study

The purpose of this study was to first re-establish factorial validity of the MSLQ, assess its predictive strength for low, middle and high income students, and then evaluate if academically successful motivational and study skills profiles differ along income and ethnic lines.

The study was divided into three parts. The first part of the study sought to evaluate the factorial structure of the MSLQ when applied to a community college student population. Part two of the study conducted a series of regression analyses to answer two research questions: 1) does the MSLQ significantly predict GPA performance among low, middle and high income student populations; and 2) does the strength of the predictive ability of the MSLQ significantly differ among low, middle and high income student populations? The third part of the study sought to answer research question three, whether by conducting a Multiple Analysis of Variance (MANOVA), it is possible to determine significant differences exist between the group's mean scores for both students from low socioeconomic backgrounds and for students from ethnically diverse backgrounds. The goal of the regression analysis and the MANOVA of the study was to determine whether evidence exists which suggests socioeconomic background does have a significant contextual impact on one's motivational and study skills development.

Why this Study Needed to be Conducted

The MSLQ was developed by administering a large number of theoretically based questions to a sample of college students (Pintrich et al., 1991). The answered questions, Pintrich and Smith (1993) state, were either positively or negatively correlated to the dependent variable—GPA. Those questions showing the highest intended correlational value were most likely kept as part of the study, whereas questions with lower or no correlational value were most often eliminated. Through this methodology, a successful motivational-study skills pattern should emerge. This method is useful in developing a single successful pattern, presumably for others to follow. In this case, the sample populations with both the 1991 and the 1993 study were most likely weighted with middle and upper income students (Benson, 1998). This is acceptable as long as the successful motivational patterns of any missing or underrepresented group—in this case the low income student population—do not significantly differ from the larger sample.

If no significant evidence exists showing differences are successfully measured, then the MSLQ should be highly recommended for use with a number of on-campus intervention programs targeting low income student populations. The implications would be that the multiple theoretical constructs that comprise the MSLQ are broad enough to preclude any socioeconomic or cultural effects.

However, if evidence from this study supports the research question, that significant differences do exist between the successful motivational and learning skill patterns of middle and high income student populations and of low income student populations, then the results would lend credibility to Kitayama (2002) and Tangney and

Leary's (2003) argument that an individual's contextual characteristics do play a significant role in the development of his or her motivation and/or cognitive learning. If this is the case, the results of this study could also help to illustrate the pitfalls of adhering to a single traditional method of delivering curriculum. The repercussions for the study of this scenario would also support Pintrich's (2002) conclusion that further research needs to be conducted to better understand what differing learning profiles exist, how they are influenced and how teaching methodologies could be developed utilizing the differing motivational and learning strategies profiles.

Description of the Study

In an effort to produce comparable results, the first part of this study sought to utilize much of the methodology used with the original normed study cited in the MSLQ testing guide (Pintrich et al., 1991). In both sections, the new study will seek to compare the fit of each model to the total number of low income students participating, as well as undertake further individual comparisons of any significantly numbered minority group within the larger sampled population.

Variables

Assessment scoring of the 15 subsections of the MSLQ served as the independent variables for both sections, and the individual student's end of semester GPA will serve as the first dependent variable. College cumulative GPA will serve as the second dependent variable for both sections. Correlations between the variables will be calculated.

Part I: Confirmatory Factor Analysis

As in the original study (Pintrich et al., 1991; Pintrich et al., 1993), confirmatory

factor analysis was conducted for the first part of this study to test for the factor validity of both sections of the MSLQ. According to Pintrich et al. (1991), confirmatory analysis was used on the 1991 MSLQ model to test for factor validity for the motivation and cognitive and metacognitive strategy items. Confirmatory factor analysis (Pintrich et al., 1991) requires the researcher to indicate what indicators or items should fall onto which latent variables or factors.

Part I1: Regression Analysis

Part two of the study conducted a series of regression analyses to answer two research questions: 1) does the MSLQ significantly predict GPA performance among low, middle and high income student populations; and 2) does the strength of the predictive ability of the MSLQ significantly differ among low, middle and high income student populations? The goal of the regression analysis and the MANOVA was simply to unearth some evidence to suggest socioeconomic background does have a significant contextual impact on one's motivational and study skills development.

Part III: Multivariate Analysis/Analysis of Variance

Part two of the study conducted MANOVA comparisons to examine if significant differences existed between the group's mean scores for both students from low socioeconomic backgrounds and students from ethnically diverse backgrounds. Results from this section manifested themselves through significantly differing group patterns of academic success. The goal of this section of the study was to determine whether there was evidence suggesting that socioeconomic background does have a significant contextual impact on one's motivational and study skills development.

The third research question addressed in the third part of the study was: Do

successful academic motivational and/or study skills profiles significantly differ between low, middle and high income student populations?

Definitions Contained Within the MSLQ

Motivation Questions

Value component: intrinsic goal orientation—questions 1,16,22,24.

Goal orientation generally refers to the students' awareness of the reasons why they are engaging in the learning task. On the MSLQ, goal orientation refers to the student's general goals or orientation to the course as a whole. Pintrich et al. hold that intrinsic goal orientation concerns the degree to which the student perceives himself or herself to be participating in a task for reasons such as challenge, curiosity, and mastery. Having an intrinsic goal orientation toward an academic task indicates that the student's participation in the task is an end all to itself, rather than participation being a means to an end (Pintrich et al., 1991).

Value component: extrinsic goal orientation—questions 7,11,13,30.

Extrinsic Goal Orientation seeks to balance intrinsic goals and concerns with the degree to which the student perceives himself or herself to be participating in a given task. Pintrich et al. hold that when one is high in extrinsic goal orientation, engaging in learning tasks is the means to an end. In other words, the student's concern is not directly related to participating in the task itself (Pintrich et al., 1991).

Value component: task value—questions 4,10,17,23,26,27.

Task value differs from goal orientation in that task value refers to the student's evaluation of how interesting, how important, and how useful the task is (what do I think

of this task?). Goal orientation refers to the reasons why the student is participating in the task (why am I doing this?). High task value should lead to more involvement in one's learning. Task value on the MSLQ to refer to the student's perceptions of the course material in terms of interest, importance, and utility (Pintrich et al.).

Expectancy component: control of learning beliefs—questions 2, 9, 18, 25.

Control of learning refers to students' beliefs that their efforts to learn will result in positive outcomes. Pintrich et al. hold that this element concerns the student's belief that academic outcomes are contingent on his or her own effort. That is, if the student feels that he or she can control their academic performance, he or she is more likely to put forth what is needed strategically to effect the desired changes (Pintrich et al., 1991.).

Expectancy component: selfe fficacy for learning and performance—questions 5, 6, 12, 15, 20, 21, 29, 31.

The items encompassed in this scale evaluate two aspects of expectancy. First, expectancy for success refers to performance expectations and relates specifically to task performance. Second, self-efficacy is a self-appraisal of the student's ability to master a task. Within the confines of the MSLQ, self efficacy includes judgments about a student's ability to accomplish a task, as well as his or her confidence that he or she possesses the skills needed to perform that task (Pintrich et al., 1991).

Affective component: test anxiety—questions 3,8,14,19,28.

Test anxiety is negatively related to expectancies as well as to academic performance. Test anxiety is thought to have two components: a worry, or cognitive component, and an emotionality component. The worry component refers to students' negative thoughts that disrupt performance, while the emotionality component refers to

affective and physiological arousal aspects of anxiety. Training in the use of effective learning strategies and test-taking skills should help reduce the degree of anxiety (Pintrich et al., 1991).

Learning StrategiesQ uestions

Cognitive and metacognative strategies: rehearsal—questions 33,36,41,44,54,55,56,57,61,76,78,79.

Basic rehearsal strategies involve reciting or naming items from a list to be learned. These strategies are best used for simple tasks and activation of information in working memory, rather than for acquisition of new information in long-term memory. These strategies influence the attention and encoding process. Rehearsal strategies do not appear to help students construct internal connections among different pieces of information or integrate the information with prior knowledge ((Pintrich et al., 1991).

Cognitive and metacognative strategies: elaboration—questions 53,62,64,67,69,81.

Elaboration strategies help students store information into long-term memory by building internal connections between items to be learned. Elaboration strategies incorporated in the MSLQ. included paraphrasing, summarizing, creating analogies, and generative note-taking. These strategies help the learner integrate and connect new information with prior knowledge (Pintrich et al., 1991).

Cognitive and metacognitive strategies: organization—questions 32,42,49,63.

Organization strategies help the learner select appropriate information to study and also construct connections among the information to be learned. The following are examples of organizing strategies: clustering, outlining, and selecting the main idea in

reading passages. Organizing, is an active, effortful endeavor, and results in the learner being closely involved in the task (Pintrich et al., 1991).

Cognitive and metacognitive strategies: critical thinking—questions 38,47,51,66,71.

Pintrich et al. (1991) deem critical thinking to be the degree to which students report applying previous knowledge to new situations in order to solve problems, reach decisions, or make critical evaluations with respect to standards of excellence.

Cognitive and metacognitive strategies: metacognitive selfr egulation—questions 33,36,41,44,54,55,56,57,61,76,78,79.

Pintrich et al. (1991) deem metacognitive skills to be awareness, knowledge, and control of cognition. They focused on the control and self-regulation aspects of metacognition on the MSLQ, not the knowledge aspect. There are three general processes that make up metacognitive self-regulatory activities: planning, monitoring, and regulating. Planning activities such as goal setting and task analysis, help to activate, or prime, relevant aspects of prior knowledge within the student that makes organizing and comprehending the material easier. Monitoring activities include tracking of one's attention as one reads, and self-testing and questioning. These activities assist the learner in understanding the material and integrating it with prior knowledge. Regulating in the MSLQ testing guide refers to the fine-tuning and continuous adjustment of one's cognitive activities. These regulating activities are assumed to improve performance by assisting learners in checking and correcting their behavior as they proceed on a task (Pintrich et al., 1991).

Resources management strategies: time and study environment—questions 35,43,52,65,70,73,77,80.

Besides self-regulation of cognition, found that students must be able to manage and regulate their time and their study environments. Time management involves scheduling, planning and managing one's study time. This includes not only setting aside blocks of time to study, but also the effective use of that study time, and setting realistic goals. Time management varies in level, from an evening of studying to weekly and monthly scheduling. Study environment, in this study as well as with the original, refers to management of the setting where the student does his or her class work. Preferably, the learner's study environment should be organized, quiet, and relatively free of visual and auditory distractions (Pintrich et al., 1991).

Resource management strategies: effort regulation—questions 37,48,60,74.

Self regulation also includes a student's ability to control his or her effort and attention in the face of distractions and uninteresting tasks. Effort management is thought to be similar to self-management, and reflects a commitment to completing a student's study goals, even when there are difficulties or distractions. Effort management is important to academic success because it not only signifies goal commitment, but regulates the continued use of learning strategies (Pintrich et al., 1991).

Resource management: peer—questions 34,45,50.

Pintrich et al. (1991) find collaborating with one's peers does have positive effects on achievement. Dialogue with peers can help a learner clarify course material and reach insights the student may not have attained on his or her own.

Resource management: help seeking—questions 40,58,68,75.

A student must learn to manage the support of others. Good students know when they do not know something and are able to identify someone who can provide them with assistance (Pintrich et al., 1991).

Participants

It was assumed that all students participating in the study were college students (18 and above) and were over the age requiring additional regulations for under-aged subjects. Participants were students selected from various participating classes such as Psychology, College Algebra, Physics, Chemistry and English. Three hundred fifty subjects were expected to participate in the study. The subjects were involved only long enough to fill out the demographic sheet, grade release consent form and the actual questionnaire. Grade information was gathered from the school at the end of the semester.

Time Line for Study

Data for this proposed study was collected during the 2005 fall semester or until a meaningful student sample number (350) was gathered. Analysis of the data was completed when the end of semester GPA was reported.

Administering the MSLQ

No intervention or manipulation of the subjects or their environment was done in this study. The MSLQ (Pintrich et al., 1991) is a self-report instrument designed to assess college students' motivational orientations and their use of different learning strategies. The MSLQ is based on a general cognitive view of motivation and of learning strategies (Pintrich et al., 1991). The MSLQ consists of two sections—a motivational section and a learning strategies section. The motivation section consists of 31 items that evaluate

students' academic goals and values, their beliefs about their ability to succeed in a course, and their anxiety about course tests. The learning strategy section includes 31 items concerning students' use of different cognitive and metacognitive learning strategies. The learning strategies section also includes 19 items regarding the students' management of academic resources.

The researcher administered the MSLQ to each class. The host institution's IRB appointed college official, rather than the class instructor, was also present to help collect the MSLQ, Demographic Information Sheet, and the Consent Form. The MSLQ and the Demographic Information Sheet were collected by the researcher. The Consent Form with the student's name and Social Security Number was collected by the appointed college official. The consent form remained with the IRB office until the end of the semester when they appointed a person to collect the end of semester grade and financial aid information. The end of semester grade information, given to the researcher by the host institution's IRB office, did not include either the student's name or the student's social security number. Instead, the information collected by the host institution's IRB office was reported to the researcher by the individual packet number listed in the upper right hand corner of the Student Consent Form. Individually matching numbers were printed on each MSLQ and MSLQ Demographic Information Sheet. This set up a blind study. The host institution's IRB office maintained the signed consent forms in a secure place for a period of one year. After such time, the signed consent forms will be destroyed.

It was important to the host institution's IRB office to collect a whole social security number versus a partial number on the Consent Form to facilitate ease in

collecting end of semester GPA information from the college's electronic database (Banner). If a whole social security number was not collected, then the person appointed by the host institution's IRB office to collect the end of semester GPA and financial aid award data would have to manually sort and match. This process takes time and poses a problem when large numbers of students – such as in the case of this study - had to be matched.

An additional income question asking about guaranteed student loan qualification was included on the demographic sheet. Although this question was totally dependent upon self-report methods, it was hoped the data collected would be accurate enough to effectively separate middle and high income students. The Financial Aid tables and guidelines for the Federal Guaranteed Student Loan Program are intentionally not published by the U.S. Department of Education, but qualifications roughly fall along what the Department considers to be middle and high income lines.

Handling of Data

The scored and numbered MSLQs and demographic sheets (those filled out by the student) remained with the researcher in a secure location for one year after the successful defense of this dissertation. Soon after that date, the researcher will destroy all the originally scored MSLQs and Demographic sheets. The electronic database created by the originals will be retained by the researcher in a secure location.

Unless an individual student requests the results of their MSLQ, information will not be given back to the institution in any format that would enable the host institution to identify individual student results. In the case that a student does request his or her

results, the researcher will either release the individual results to the appropriate host institution IRB official to mail the results to the student, or the host institution IRB official will release the participant name and packet number to the researcher so he can either mail the results to the student or go over the results with the student in person. No follow-up information will be given to the participants of the study unless the participant requests his or her results in writing within one year from the host institution. A contact information sheet with the appropriate host institution Institutional Review officials, researcher, IRB Chair Person was provided to the study's participants for them to keep. A follow-up report of the study's overall findings will be made to host institution officials.

Measures to Protect the Participant's Anonymity

As the study is presently written, the signature page containing the name, social security number, and authorization signature remains with the institution, and only the correspondingly numbered demographic information sheet and correspondingly numbered questionnaire would be released to the researcher. The researcher never saw either the names or the social security numbers of the participating students. Only authorized campus personnel who looked up GPA information on Banner (the host institution's student management system) saw the individual social security numbers or the financial aid information. The institution will report grade information to the researcher through the individually assigned survey packet number. The packet number serves as the key for the signature page, demographic sheet, and the survey to ensure that the study is conducted using a blind methodology.

Sensitive Information

Grade information, financial aid participation, and the use of social security numbers can be considered sensitive information. Unless an individual student requested his or her results, the researcher was not given any information by the host institution that would enable him to identify an individual student participating in the study by name or social security number. The researcher knew the individual participants only by packet number.

Justification for the Use of Whole Social Security Numbers

The entire social security number was necessary for the institution to pull up the student's end of class GPA, end of semester GPA, and overall GPA. The host institution uses the Banner computer program to manage their student files. Banner requires either the student ID (which is different than the student's social security number) or the student's social security number. Ideally, the researcherc ould request the student's identification number, but it has been the case in the past that a large percentage of students do not remember their school identification numbers when asked in a survey setting such as this. The fear of the researcher was that this would be the case in this study and a significant number of the population might opt out of the study simply because they could not remember their student identification numbers.

Possible Benefits to the Subjects or Society

If no significant evidence exists that differences of predictability or significantly differing motivational profilesare successfully measured, then the MSLQ should be highly recommended for use in a number of on-campus intervention programs targeting low income student populations. The implications would be the multiple theoretical

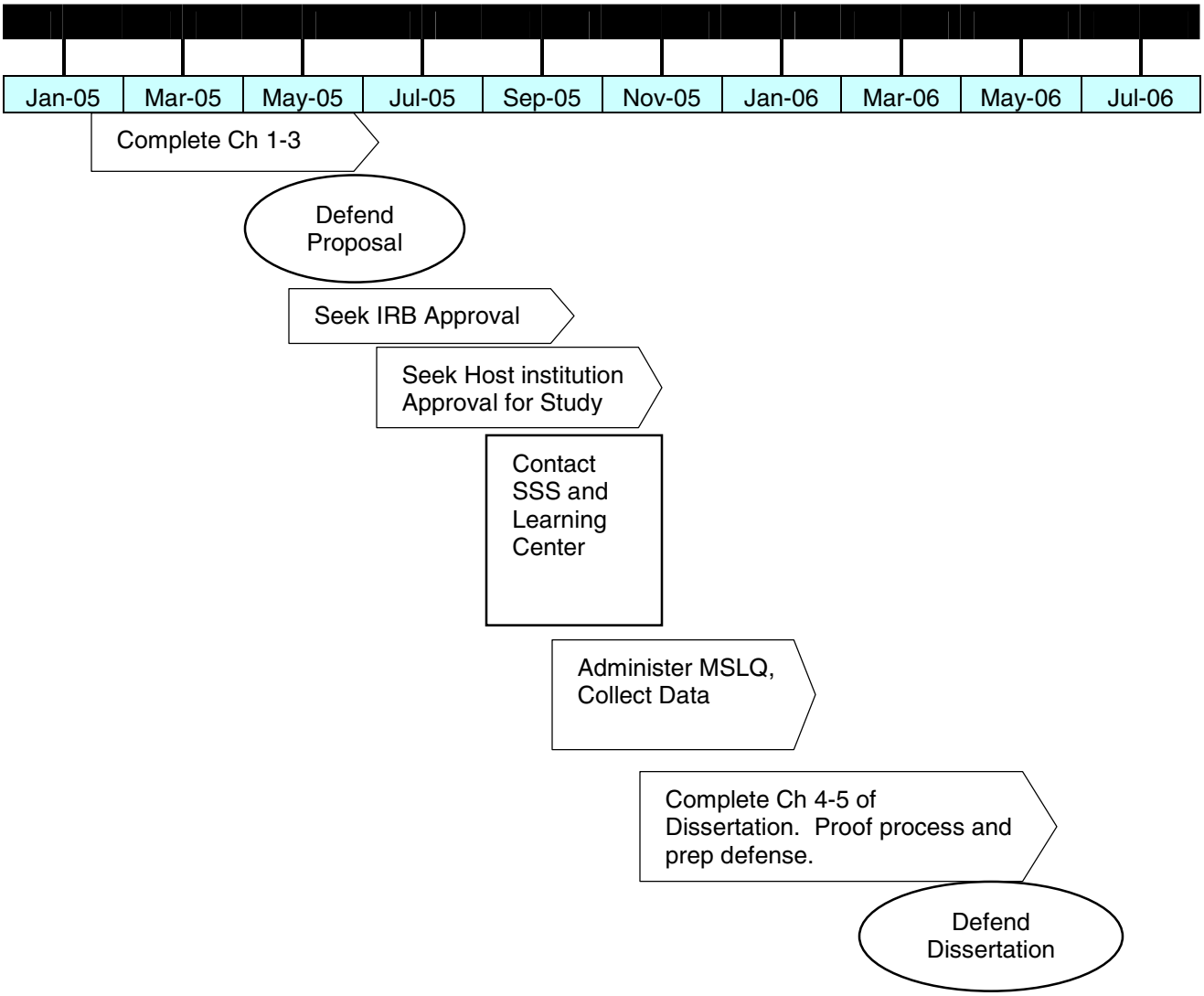
constructs that make up the MSLQ are broad enough to preclude any socioeconomic or cultural effects.

However, if the results prove differences of predictability or differing motivational profiles do exist between low, middle, and high income student populations, then this study would lend credibility to Kitayama (2002) and Tangney and Leary's (2003) arguments. They contend an individual's contextual characteristics do play a significant role in the development of his or her motivational and/or cognitive learning. If this is the case, the results of this study could also help to illustrate the pitfalls of adhering to a single traditional method of delivering curriculum. The repercussions of this scenario would also support Pintrich's (2002) conclusion that further research needs to be conducted to better understand what differing learning profiles exist, how they are influenced, and how teaching methodology could be developed utilizing the differing motivational and learning skills profiles.

IRB Approval

IRB permission for this study was sought in the spring of 2005. Appropriate officials from the host institution was sought out to ascertain permission to conduct the study. The final publication includes appropriate IRB documentation from both Oklahoma State University and the host institution, if the appropriate authority deems it necessary to review the study through its own IRB process.

Timeline of Study



Data for this study was collected during the 2005 fall semester or until a meaningful student sample number (350) was gathered. Appropriate comparisons of each semester's data were conducted to ensure compatibility. Analysis of the data was completed once the end of the semester GPA was reported. Individual scored and numbered MSLQ packets were returned to the host institution with an analysis of the data.

CHAPTER 4

FINDINGS

Purpose and Methodology

The purpose of this study was to first re-establish factorial validity of the MSLQ and assess its predictive strength for low, middle and high income students and then to evaluate if academically successful motivational and study skills profiles differ along income and ethnic lines.

The study was dividednto three parts. The first part of the study s ought to evaluate the factorial structure of the MSLQ when applied to a community college student population. Part two of the study conducted a series of regression analyses to answer two research questions: 1) does the MSLQ significantly predict GPA performance among low, middle and high income student populations; and 2) does the strength of the predictive ability of the MSLQ significantly differ among low, middle and high income student populations? The third part of the study, conducting a MANOVA, sought to answer research question three, whether significant differences exist between the group's mean scores for both students from low socioeconomic backgrounds and for students from ethnically diverse backgrounds. The goal of the regression analysis and of the MANOVA was to unearth some evidence to suggest that socioeconomic background does have a significant contextual impact on one's motivational and study skills development.

Factor analysis methodology was conducted to test for factor validity among the

economic subgroups. A MANOVA was conducted to ascertain if significantly different successful motivational and/or study strategy profiles exist within the mean scores of the MSLQ along economic and/or ethnic lines. The 15 different MSLQ subsections served as the independent variables, and the student's end of semester class grade served as the first dependent variable, while the semester and cumulative GPA served as the second and third possible dependent variables. The results offered in this chapter are the analyses related to the research questions.

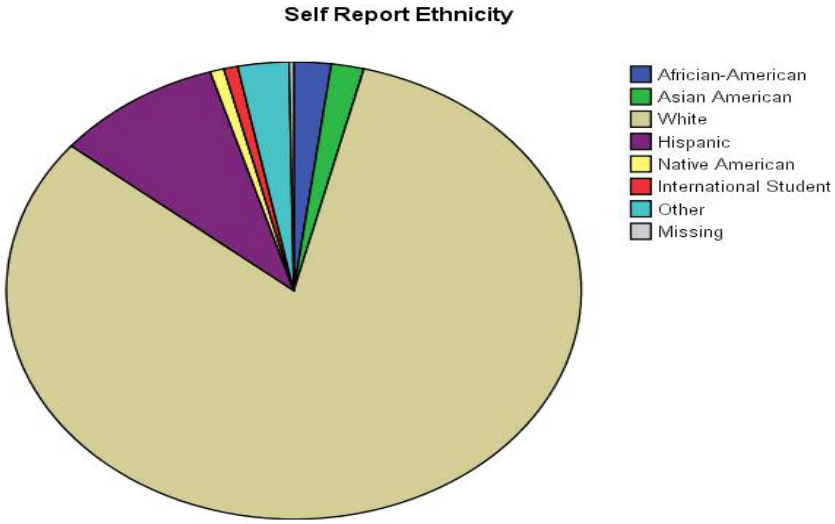
The results of this study could have a significant impact on the analysis of why students from lower socioeconomic backgrounds are typically not as academically successful as their middle and high income counterparts. That is, the study could establish that the traditional view of what constitutes motivation is not applicable for those students. Further, the results of this study could also indicate the significance, or lack thereof, of the use of study skills methods traditionally thought to be important for academic achievement.

Data Management

As agreed with the IRB Office at Oklahoma State University and the host institution, an option to participate in the study was given to the students. Four hundred thirty-three individual MSLQ packets were handed out to students in 18 different classes during the fall 2005 semester. Three hundred ninety-four MSLQ packets were completed and returned to the researcher at the host institution. Sixteen signature pages were misplaced by the host institution's research office and an additional 13 MSLQ packets had been numbered incorrectly and were therefore excluded. In total, 365 completed MSLQ packets were included in this study. This gave the study an 84 percent completion

rate. Accuracy checks were made as the data was entered into SPSS. A final randomized accuracy check was made with the third, fifth and seventh of every ten lines checked before the data was analyzed. Graphical representations of the demographics of the participants are given below.

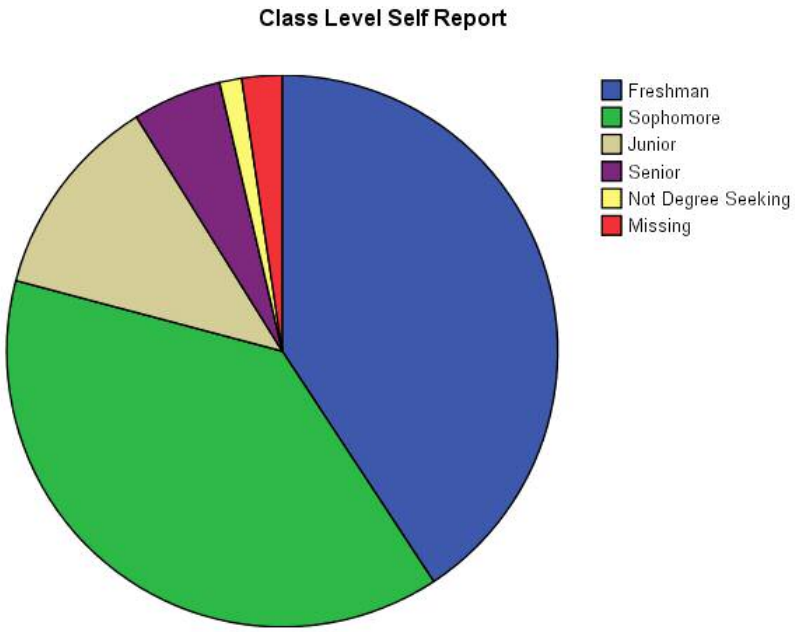
Figure 3



Ethnicity Self Report

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	African-American	8	2.1	2.1	2.1
	Asian American	7	1.8	1.8	3.9
	White	314	82.0	82.2	86.1
	Hispanic	36	9.4	9.4	95.5
	Native American	3	.8	.8	96.3
	International Student	3	.8	.8	97.1
	Other	11	2.9	2.9	100.0
	Total	382	99.7	100.0	
Missing	System	1	.3		
Total		383	100.0		

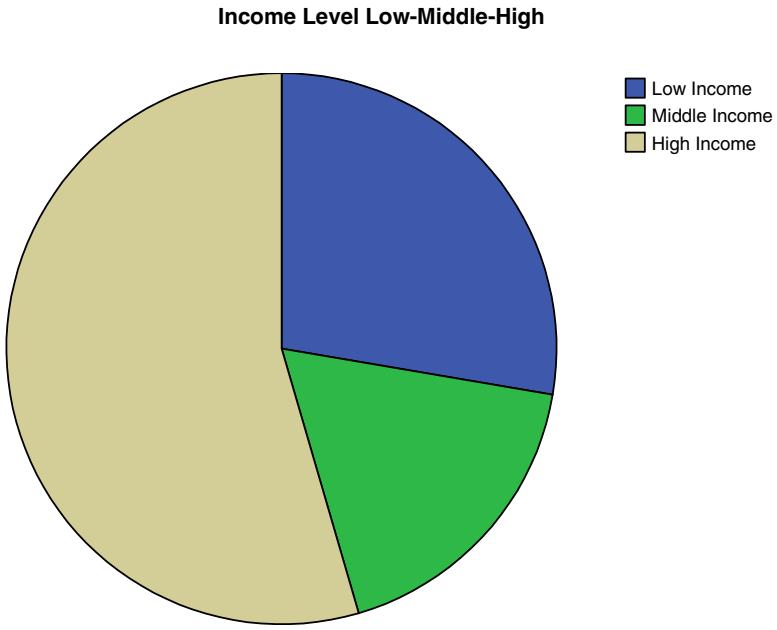
Figure 4



Class Level Self Report

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Freshman	156	40.7	41.7	41.7
	Sophomore	147	38.4	39.3	81.0
	Junior	46	12.0	12.3	93.3
	Senior	20	5.2	5.3	98.7
	Not Degree Seeking	5	1.3	1.3	100.0
	Total	374	97.7	100.0	
Missing	System	9	2.3		
Total		383	100.0		

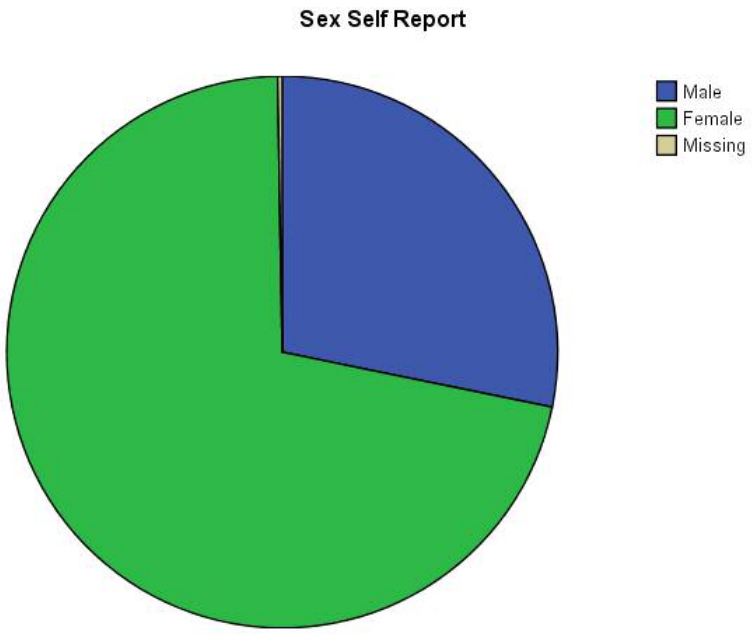
Figure 5



Income Level Low-Middle-High

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low Income	101	27.7	27.7	27.7
	Middle Income	65	17.8	17.8	45.5
	High Income	199	54.5	54.5	100.0
	Total	365	100.0	100.0	

Figure 6



Sex Self Report

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	108	28.2	28.3	28.3
	Female	274	71.5	71.7	100.0
	Total	382	99.7	100.0	
Missing	System	1	.3		
Total		383	100.0		

Part I: Assessment of Factor Validity of the MSLQ

The purpose of the first part of this study was to simply evaluate the MSLQ's factor validity when applied to a community college student population and then to establish the factor validity of this measure when looking at populations with either high, middle, or low socioeconomic status to allow additional comparisons of the MSLQ

subscales along income lines.

Establishing factor validity for a multi-concept instrument like the MSLQ reaffirms that the students understand the questions well enough that the subsections' questions group tightly together. Ideally, the resulting factors would be independent of each other. Given the scoring methodology of the MSLQ, it is paramount that the factors load as predicted. The MSLQ offers percentile scores of the individual sections as feedback for each student. If the individual factors do not load as predicted, the student could receive inaccurate information about where he or she places on the theoretical subscales.

As in the original MSLQ validation study (Pintrich et al., 1991), this study sought to confirm that the individual questions within the Motivation and Study Strategies sections loaded together into theoretically independent factors. To confirm that the individual factors loaded as predicted, SPSS was restricted to search for six factors for the Motivation section and nine factors for the Study Strategies section. The Varimax rotation method was used to ensure that all of the accountable variance was identified. Missing values were excluded listwise.

Factorial Evaluation of Motivation Section

Although recognizable groupings emerged within all but one of the Motivation items, *Intrinsic Goal Orientation* (Q1,16,22,24) lost its independent factor validity and loaded instead on *Task Value* (Q4, Q10, Q17, Q23, Q26, Q27) and *Self Efficacy for Learning and Performance* (Q5, Q6, Q12, Q15, Q20, Q21, Q29, Q31) (see Figure 7). Factor loadings of individual motivational items in Figure 7 are color-coded to aid in the identification of item groupings.

Figure 7
Factor Analysis Motivation: (6 Factor Force Extractions)
Varimax Rotated Component Matrix (a)

	Component					
	1	2	3	4	5	6
Q1	.430	**.565**	.028	.000	-.100	.037
Q16	.447	**.481**	.075	-.088	.122	-.294
Q22	**.693**	.313	.137	.227	-.086	.227
Q24	**.511**	.322	.253	.012	-.194	-.108
Q7	.280	.141	.103	**.639**	-.006	.256
Q11	.088	.088	.172	**.699**	-.083	-.052
Q13	.090	.364	.124	**.549**	.003	-.090
Q30	.244	.088	.096	**.643**	.154	-.083
Q4	**.671**	.178	-.060	.194	.246	-.019
Q10	**.663**	.203	.085	.219	.128	.372
Q17	**.850**	.215	.040	.050	.075	-.006
Q23	**.821**	.210	-.042	.224	.137	.065
Q26	**.835**	.187	-.035	.110	.150	.034
Q27	**.826**	.197	.018	.201	.121	.182
Q2	.280	.284	.015	-.020	.263	**.568**
Q9	.131	.182	.124	-.002	**.786**	.021
Q18	.313	.327	-.095	.106	**.527**	.264
Q25	.052	.149	.073	-.005	**.787**	-.003
Q5	.150	**.639**	-.277	.297	.115	.214
Q6	.145	**.772**	-.121	.098	.164	-.024
Q12	.291	**.603**	-.130	.099	.291	.120
Q15	.249	**.792**	-.106	.038	.203	-.012
Q20	.210	**.739**	-.200	.209	.101	.213
Q21	.202	**.653**	-.150	.398	.018	.276
Q29	.347	**.596**	-.125	.073	.315	.162
Q31	.294	**.635**	-.145	.348	.124	.236
Q3	-.048	-.228	**.489**	.154	.079	-.518
Q8	.005	-.071	**.617**	.169	.107	-.130
Q14	.009	-.158	**.663**	.162	.053	-.192
Q19	-.003	-.198	**.858**	.006	-.002	.141
Q28	.147	-.045	**.825**	.031	-.038	.116

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
A Rotation converged in 10 iterations.

This suggests that the students who participated in this study either did not understand the *Intrinsic Goal Orientation* questions (Q1,16,22,24) as they did in the original normed sample, the questions had a different meaning to them, or the subscale is poorly constructed. In any case, factor validity for the *Intrinsic Goal Orientation* items are in question. For this reason, *Intrinsic Goal Orientation* items were excluded from all further analyses in this study

Factorial Correction of Motivation Section

Excluding the *Intrinsic Motivation* items (Q1, Q16, Q22, Q24) and question 2 in the *Control Beliefs About Learning* items strengthens the factor validity on the Motivational scale. As can be seen in Figure 8, Chi-Square is relatively high and many of the individual factor loadings in the corrected model continue to be well below .7 (see Figure 9). Although the loadings continue to be weak, the loadings reported in the original testing guide were weak also (Pintrich et al.,1991). The Motivation section could be strengthened further by excluding more of the questions with weak factor loadings, but doing so also marginally reduced the already weak correlations exhibited in the regression analysis section (see Figure 9), so it was not done here. As in Figure 7, factor loadings of individual Motivational items are color-coded to aid in the identification of item groupings.

Figure 8
Factor Analysis Motivation: (Limited to 5 Components)
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.900
Bartlett's Test of Sphericity	Approx. Chi-Square	5509.339
	df	325
	Sig.	.000

Figure 9
Factor Analysis Motivation: (Limited to 5 Components)
Rotated Component Matrix(a)

	Component				
	1	2	3	4	5
Q7	.197	.307	.099	**.630**	-.045
Q11	.074	.069	.139	**.750**	-.057
Q13	.333	.048	.120	**.580**	.018
Q30	.077	.232	.121	**.650**	.148
Q4	.196	**.680**	-.014	.156	.188
Q10	.282	**.710**	.048	.221	.095
Q17	.218	**.851**	.065	.031	.028
Q23	.243	**.833**	-.001	.176	.075
Q26	.209	**.856**	.009	.068	.090
Q27	.236	**.853**	.040	.167	.063
Q9	.177	.148	.126	-.010	**.797**
Q18	.363	.347	-.135	.129	**.516**
Q25	.134	.055	.077	-.010	**.809**
Q5	**.693**	.172	-.259	.244	.072
Q6	**.779**	.132	-.077	.051	.139
Q12	**.622**	.299	-.130	.080	.258
Q15	**.805**	.232	-.067	-.016	.162
Q20	**.782**	.226	-.190	.165	.064
Q21	**.731**	.220	-.137	.337	-.041
Q29	**.659**	.377	-.127	.035	.312
Q31	**.721**	.328	-.112	.269	.070
Q3	-.292	-.107	**.566**	.147	.079
Q8	-.089	-.020	**.610**	.187	.144
Q14	-.147	.005	**.700**	.141	.035
Q19	-.138	.038	**.856**	-.019	-.033
Q28	-.018	.175	**.820**	.016	-.073

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
A Rotation converged in 7 iterations.

Factor Analysis of Learning Strategies Section of MSLQ

Although recognizable groupings emerged within the Study Strategies section, two of the subscales, *Time and Study Environment* (Q35, 43, 52R, 65, 70, 73, 77R, 80R)

and *Metacognitive Self Regulation* (Q37R, Q48, Q60R , Q74), load randomly enough to discredit their recommendation for future use without either deleting some questions or modifying how the results are reported to the individual student (see Figure 10).

In fact, five subscales, *Rehearsal* (Q39, 46, 59, 72), *Elaboration* (Q53, 62, 64, 67, 69, 81), *Organization* (Q32, 42, 49, 63), *Critical Thinking* (Q38, 47, 51, 66, 71), and *Effort Regulation* (Q37R, Q48, Q60R Q74), all have at least one question that loaded on a different component (see Figure 10). For the purposes of this study, these questions were deleted altogether. Other items such as *Peer Learning* (Q34, 45, 50) and *Help Seeking* (Q40R, 58, 68, 75) load on top of each other. These were deleted as well.

Figure 10
Original 9 Factor Rotated Component Matrix(a)
Learning Strategies Items
(Color coded to aid identification of factors)

	Component								
	1	**2**	**3**	**4**	**5**	**6**	7	8	9
Q39	.046	.121	.372	**.473**	.115	-.062	.197	-.109	.271
Q46	.118	.213	.394	**.486**	-.010	-.075	.081	.296	.158
Q59	.264	.040	.321	**.564**	.131	-.114	.047	.077	.121
Q72	.248	.069	**.626**	.144	.171	.042	.081	.076	.165
Q53	**.551**	.113	.230	.164	.071	-.083	-.035	.456	.028
Q62	**.725**	.139	.066	.105	.157	.111	.034	.037	.090
Q64	**.642**	.136	.138	.445	.008	.026	-.018	-.101	.032
Q67	.154	.008	**.647**	-.049	.045	.231	.225	.130	-.081
Q69	**.497**	.219	.148	.351	.062	-.001	.141	.383	.044
Q81	**.731**	.118	.127	.126	.081	.050	.214	.110	.108
Q32	.087	.125	**.739**	.222	.033	.067	.010	.044	-.022
Q42	.228	.147	.238	.437	-.075	.023	.064	**.489**	.183
Q49	.161	.106	**.608**	.114	.274	.162	.122	.060	.021
Q63	.142	.152	**.711**	.154	-.032	.047	.076	.198	.015
Q38	.036	-.196	.074	.151	.014	**.731**	.001	-.026	.022
Q47	.395	.065	.206	.043	.079	**.604**	-.037	.243	.008
Q51	.458	.079	.231	.042	.184	**.534**	-.006	-.061	.050

Q66	**.715**	.064	.134	.081	.050	.295	.211	-.075	.001
Q71	.499	.095	.143	-.108	.156	**.561**	.073	.149	.127
Q33R	.131	**.634**	.006	.002	-.022	.080	.110	.288	.057
Q36	.235	.110	**.484**	.175	.135	.322	.302	-.241	-.021
Q41	.145	.277	.061	**.564**	.040	.263	.046	.182	.260
Q44	.292	.064	.290	.257	.184	**.315**	.286	.154	-.043
Q54	**.465**	.021	.254	.338	.026	.175	-.026	.091	-.140
Q55	.299	.103	.364	**.456**	.105	.366	.148	-.111	-.083
Q56	.282	-.032	.111	**.345**	.145	.183	.272	.061	-.262
Q57R	.095	**.671**	.010	-.004	-.083	.039	-.194	-.193	.027
Q61	**.464**	.071	.234	.112	.235	.214	-.078	.133	-.052
Q76	.313	.141	.072	**.562**	.249	.162	.121	.148	.007
Q78	.155	.098	.271	**.407**	.248	.281	.363	.082	.079
Q79	.066	.166	.223	.198	.229	.168	.082	**.504**	-.129
Q35	.111	.208	.147	.256	.073	.015	**.624**	.154	.142
Q43	.142	**.494**	.307	.217	.218	.144	.285	.353	.199
Q52R	-.087	.549	.184	.052	-.011	.049	**.405**	-.079	-.143
Q65	.147	.203	.235	.062	.060	-.035	**.722**	.016	.074
Q70	.065	**.399**	.201	.218	.151	.152	.222	.326	.208
Q73	.019	.116	-.024	.149	.204	-.055	.156	.070	**.586**
Q77R	.053	**.678**	.194	.065	.067	-.121	.147	-.021	.009
Q80R	.103	**.606**	.099	.104	.068	-.127	.083	.036	.014
Q37R	.109	**.743**	.096	.068	.092	.024	.087	.119	.095
Q48	.112	.361	.163	**.489**	.178	.065	.133	.179	.244
Q60R	.085	**.673**	-.082	.299	-.123	.022	.001	.127	-.113
Q74	.090	**.439**	.064	.334	.133	.290	.209	.262	.332
Q34	.193	.163	.136	.195	**.510**	.229	-.220	-.151	-.124
Q45	.057	-.014	.115	-.026	**.846**	.018	.004	.064	.045
Q50	.139	-.001	.267	-.071	**.761**	.174	-.047	.012	.060
Q40R	-.109	.072	-.085	-.103	**.323**	-.166	.048	.054	-.615
Q58	.136	.150	.017	.379	**.369**	.185	.096	.159	-.145
Q68	.069	-.033	.031	.164	**.792**	-.037	.160	.076	-.034
Q75	.135	.013	-.039	.288	**.675**	.032	.205	.046	.057

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
A Rotation converged in 11 iterations.

Given the stated problems, the sampling adequacy reports .918 for the Learning Strategies items with a Chi-Square reported at 8.59 (see Figure 11).

Figure 11
Learning Strategies Items
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.918
Bartlett's Test of Sphericity	Approx. Chi-Square	8590.469
	df	1225
	Sig.	.000

Factorial Correction of Learning Strategies Items

When the Learning Strategies section is reduced from nine factors to six factors, sampling adequacy only drops from .918 to .879 while Chi-Square changes from 8.59 to 3.08, which is in range with 2.26 reported in the range MSLQ testing guide. The resulting gain allows for factor validity to be reasonably claimed (see Figure 11) and the study to continue with more meaningful comparisons of learning strategy differences that may possibly fall along income lines.

Figure 12
Corrected Learning Strategies Section (limited to 6 factors)
KMO and Bartlett's Test Factor Analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.879
Bartlett's Test of Sphericity	Approx. Chi-Square	3086.411
	df	231
	Sig.	.000

Figure 13
Modified MSLQ 6 Factor Learning Strategies Items
Rotated Component Matrix (a)
Color coded to aid identification of factors

	Component					
	1	2	3	4	5	6
Q39	.075	**.720**	.035	.093	.067	.202
Q46	.228	**.602**	-.031	-.002	.307	.317
Q59	.346	**.644**	-.001	.082	.038	.186
Q53	**.684**	.107	-.037	.111	.169	.240
Q62	**.717**	.060	.269	.132	.099	.064
Q64	**.673**	.368	.195	-.009	.028	.033
Q69	**.607**	.334	.076	.058	.286	.129
Q81	**.758**	.112	.177	.076	.111	.104
Q32	.085	.251	.116	.036	.082	**.799**
Q49	.195	.185	.158	.331	.058	**.591**
Q63	.186	.215	.125	-.031	.112	**.792**
Q38	-.071	.165	**.838**	.008	-.155	.001
Q47	.337	-.083	**.616**	.108	.179	.285
Q51	.315	.025	**.622**	.226	.103	.183
Q71	.404	-.067	**.637**	.183	.139	.129
Q37R	.122	.045	-.022	.077	**.811**	.167
Q48	.150	.557	.096	.143	**.481**	.130
Q60R	.181	.087	-.026	-.156	**.744**	-.008
Q74	.120	.391	.272	.100	**.631**	.064
Q34	.119	.220	.295	**.596**	.057	-.098
Q45	.075	.039	-.019	**.886**	-.020	.058
Q50	.092	.013	.143	**.858**	-.015	.189

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
A Rotation converged in 8 iterations.

Further Factor Analysis Exploration Suspended

It was originally hoped that further comparisons could be made along income lines to see if factor analysis held up with each group, but making further comparisons meant reducing N for each subgroup to below half of what is recommended (Pintrich et

al.,1991) for meaningful comparisons of factor validity. Despite this, the researcher did make further comparisons and did observe that all but *Self Efficacy* lost its grouping cohesion with low income students, and half of the factors from the high income group lost its grouping cohesion. Interestingly, despite the low N of the middle income group, factor groupings held with all but one variable.

Part II: Evaluation of the Predictive Ability of the MSLQ to GPA (Regression Analysis)

A regression analysis was conducted to determine the answers to two questions: 1) does the MSLQ significantly predict GPA performance among low, middle and high income student populations; and 2) does the strength of the predictive ability of the MSLQ significantly differ among low, middle and high income student populations?

The MSLQ was developed by administering a large number of theoretically based questions to a sample of college students (Pintrich et al., 1991). The answered questions, Pintrich and Smith (1993) point out, were either positively or negatively correlated to the dependent variable, GPA. Those questions that showed the highest correlational value were kept as part of the final questionnaire, whereas questions with low or no correlational value were thrown out. Through this methodology, a successful Motivational-Study Skills patten should emerge . This method is useful in developing a single successful pattern, presumably for others to follow (Pedhazur, 1997). This methodology is acceptable as long as the population used to create the instrument is truly representative of the whole population for which it is intended to generalize. The sample populations in both the 1991 and the 1993 studies were most likely weighted with middle and high income students (Benson, 1998).

Including a regression analysis in this study is important because it answers the

question (research questions two and three) of whether the MSLQ does significantly predict GPA performance among low, middle and high income student populations. The predictive ability of the MSLQ to the dependent variables of class grade, semester GPA and cumulative GPA, gives valuable insight into how much of the variance of academic success can be accounted for by both motivation and learning strategies.

The MSLQ testing guide suggests the original 15 scales can be used together or individually. The MSLQ testing guide states "the scales are designed to be modular and can be used to fit the needs of the researcher or instructor". The testing guide includes correlation charts with both the Motivation and Learning Strategy scales together and then separately. Because the previous factor analysis conducted in this study identified only 12 factorially sound Motivational and Learning Strategy subscales, the following regression analysis only included those 12 Motivation and Learning Strategy subscales (Pintrich et al., 1991).

Regression Analysis of Motivation and Learning Strategy Items Together

When all of the subscales are entered into a regression analysis together as a whole instrument (see Figure 14), the resulting R was .345, while R Square accounted for only 12% of the variance because of the dependent variable class grade. Regression analysis was also conducted with dependent variable semester GPA with like results of R reporting .370 while R square accounted for a marginally higher 13.7 of the variance. Cumulative GPA is slightly less predictive, reporting R at .370 with R Square accounting for 13.5 % of the variance. *Effort Regulation* accounted for all of the variance of the model when Cumulative GPA was used as the dependent variable.

Figure 14
Regression Analysis MSLQ
Both Motivation and Learning Strategy Sections
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.345(a)	.119	.116	1.10488
2	.392(b)	.154	.149	1.08425

a Predictors: (Constant), *Effort Regulation*
b Predictors: (Constant), *Effort Regulation , Self Efficacy*

Figure 15
Regression Analysis MSLQ
Both Motivation and Learning Strategy Sections
Variables Entered/Removed(a)

Model	Variables Entered	Variables Removed	Method
1	Effort Regulation	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	Self Efficacy	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a Dependent Variable: Class Grade Numeric

Figure 16
Regression Analysis MSLQ
Both Motivation and Learning Strategy Sections
ANOVA(c)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	56.064	1	56.064	45.925	.000(a)
	Residual	416.282	341	1.221		
	Total	472.346	342			
2	Regression	72.646	2	36.323	30.898	.000(b)
	Residual	399.700	340	1.176		
	Total	472.346	342			

a Predictors: (Constant), *Effort Regulation*
b Predictors: (Constant), *Effort Regulation, Self Efficacy*
c Dependent Variable: Class Grade Numeric

Regression Analysis of Motivation Section

The answer to research question one, do Motivational items contained in the MSLQ appropriately correlate (either positively or negatively) with GPA, is that all of the Motivational subscales were significantly correlated to end of semester class grade at the .05 level. R for all of the motivational subscales reported at .392 (seeFigure 14). Stepwise method was used in a linear regression analysis to evaluate the Motivational subscales. Missing values were excluded listwise. Although the correlations for all of the sub-items were significant, *Self Efficacy* and *Task Value* accounted for the total variance of the five included Motivational subscales.

Regression analysis was also conducted using the dependent variable semester GPA with like results of R reporting .30 while R square accounts for less than nine percent of the variance. Cumulative GPA is slightly less predictive, reporting R at .29

with R Square accounting for eight percent of the variance. *Self Efficacy* accounted for the total variance reported when semester GPA was used as the dependent variable, while *Self Efficacy* and *Task Value* accounted for all of the variance of the model when cumulative GPA was used as the dependent variable.

Figure 17
Motivation Section Only (Limited to 5 Components)
Whole Group
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.333(a)	.111	.108	1.11218
2	.353(b)	.124	.119	1.10526

a Predictors: (Constant), *SelfE fficacy*
b Predictors: (Constant), *SelfE fficacy, Task Value*

Figure 18
Corrected Motivation Section (Limited to 5 Components)
ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54.624	1	54.624	44.160	.000(a)
	Residual	437.881	354	1.237		
	Total	492.505	355			
2	Regression	61.278	2	30.639	25.081	.000(b)
	Residual	431.228	353	1.222		
	Total	492.505	355			

a Predictors: (Constant), S*elfE fficacy*
b Predictors: (Constant), *SelfE fficacy, Task Value*
c Dependent Variable: Class Grade Numeric

Regression Analysis of Learning Strategy Section

Results of the regression analysis of the Learning Strategy section suggest that all of the Learning Strategies items positively correlate to end of semester class grade. The overall group correlation reported an R of .331 with R Square accounting for a weak 11 percent of the variance (see Figure 19). *Effort Regulation* accounted for the total variance reported in this section.

Regression analysis was also conducted using the dependent variable semester GPA with like results of R reporting .326 while R square accounts for less than 11 percent of the variance. Cumulative GPA is slightly more predictive, reporting R at .364 with R Square accounting for 13% of the variance. *Effort Regulation* accounted for the total variance reported when both Semester GPA and Cumulative GPA are used as the dependent variables.

Figure 19
Learning Strategies Regression (Whole Group)
Stepwise Method Selection
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.331(a)	.110	.107	1.10905

a Predictors: (Constant), *Effort Regulation*

Figure 20
Learning Strategies Regression (Whole Group)
Stepwise Method Selection
Variables Entered/Removed(a)

Model	Variables Entered	Variables Removed	Method
1	Effort Regulation	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a Dependent Variable: Class Grade Numeric

Figure 21
ANOVA(b) (Whole Group) Learning Strategies Regression
Stepwise Method Selection

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.986	1	52.986	43.078	.000(a)
	Residual	430.498	350	1.230		
	Total	483.484	351			

a Predictors: (Constant), *Effort Regulation*
b Dependent Variable: Class Grade Numeric

Regression Comparisons Using Semester GPA and Cumulative GPA

Further comparisons were made with both semester GPA and cumulative GPA, and both were observed to be significant, but to a lesser degree. As was found in previous research, it was observed that the correlations weakened the further the comparisons were away from the setting where the MSLQ was administered. Because of the already weak correlations found with the strongest dependent variable, end of semester class grade, further exploration of correlations using semester GPA, and cumulative GPA were thought to be redundant to the purposes of the study and were therefore not conducted.

Results of this portion of the study suggest the Motivation section of the MSLQ does not significantly predict GPA performance among low income student populations. Regression analysis was conducted using the stepwise variable entry method to further evaluate if the MSLQ is a stronger predictor of academic success (as defined by the dependent variable class grade) for low income students than it is for middle or high income students. Missing data was excluded listwise. The results of the regression analysis suggested the Motivation section was a much stronger predictor of motivation

for middle and high income students than it was for low income students (see Figure 22). In fact, none of the motivational subscales reached significance for the low income group. *Self Efficacy* accounted for all of the variance of the subscales for the middle and high income groups.

Figure 22
Regression Analysis
Variables Entered/Removed (a) Stepwise Method

Low Middle High Self-report	Model	Variables Entered	Variables Removed	Method
Middle Income	1	Self Efficacy	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
High Income	1	Self Efficacy	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a Dependent Variable: Class Grade Numeric

Figure 23
Model Summary Stepwise Method Regression Analysis

Low Middle High Self-report	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Middle Income	1	.354(a)	.125	.111	.97577
High Income	1	.433(a)	.188	.184	1.10996

a Predictors: (Constant), *Self Efficacy*

Figure 24
ANOVA(b) Stepwise Method Regression Analysis

Low Middle High Self-report	Model		Sum of Squares	df	Mean Square	F	Sig.
Middle Income	1	Regression	8.325	1	8.325	8.743	.004(a)
		Residual	58.079	61	.952		
		Total	66.404	62			
High Income	1	Regression	54.714	1	54.714	44.410	.000(a)
		Residual	236.548	192	1.232		
		Total	291.262	193			

a Predictors: (Constant), *Self Efficacy*
b Dependent Variable: Class Grade Numeric

A backwards selection method (see Figure 25) was incorporated to further evaluate what the effect might be of possible variable interactions between income and the individual Motivational subscales. Although the results were not surprising, the exercise of including the data comparison in this study does serve to further illustrate that income does affect the predictive value of the MSLQ.

Figure 25
Regression Analysis
Motivation Section MSLQ
Model Summary Motivation Section
Backward Item Selection Method

Low Middle High Self-report	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Low Income	1	.261(a)	.068	.018	1.11073
	2	.261(b)	.068	.028	1.10501
	3	.255(c)	.065	.035	1.10101
	4	.249(d)	.062	.042	1.09688
	5	.194(e)	.037	.028	1.10540
Middle Income	1	.412(f)	.170	.097	.98331
	2	.411(g)	.169	.112	.97528
	3	.410(h)	.168	.125	.96781
	4	.399(i)	.159	.131	.96462
	5	.354(j)	.125	.111	.97577
High Income	1	.442(a)	.196	.174	1.11639
	2	.441(k)	.195	.178	1.11389
	3	.439(l)	.193	.180	1.11215
	4	.437(m)	.191	.182	1.11082
	5	.433(j)	.188	.184	1.10996

a Predictors: (Constant), *Self Efficacy, Test Anxiety, Control Beliefs About Learning, Extrinsic Goal Orientation, Task Value*
b Predictors: (Constant), *Self Efficacy, Control Beliefs About Learning, Extrinsic Goal Orientation, Task Value*
c Predictors: (Constant), *Control Beliefs About Learning, Extrinsic Goal Orientation, Task Value*
d Predictors: (Constant), *Extrinsic Goal Orientation, Task Value*
e Predictors: (Constant), *Task Value*
f Predictors: (Constant), *Self Efficacy, Test Anxiety, Control Beliefs About Learning, Task Value, Extrinsic Goal Orientation*
g Predictors: (Constant), *Self Efficacy, Test Anxiety, Control Beliefs About Learning, Extrinsic Goal Orientation*
h Predictors: (Constant), *Self Efficacy, Control Beliefs About Learning, Extrinsic Goal Orientation*
i Predictors: (Constant), *Self Efficacy, Extrinsic Goal Orientation*
j Predictors: (Constant), *Self Efficacy*
k Predictors: (Constant), *Self Efficacy, Test Anxiety, Control Beliefs About Learning, Task Value*
l Predictors: (Constant), *Self Efficacy, Control Beliefs About Learning, Task Value*
m Predictors: (Constant), *Self Efficacy, Task Value*

Comparisons of the Predictability of the MSLQ Along Income Lines

Results of this portion of the study suggest that although the Learning Strategy section of the MSLQ does significantly predict GPA performance among low income student populations, the predictive ability is much less than it is for middle and high income groups. Regression analysis was conducted using the stepwise variable entry method to further evaluate whether or not the MSLQ is a stronger predictor of academic success (as defined by the dependent variable class grade) for low income students, than it is for middle or high income students. Missing data was excluded listwise. The results of the regression analysis suggested that the Learning Strategy section was a much stronger predictor of motivation for middle and high income students than it was for low income students (see Figure 26). R reported .266 while R Square only accounted for seven percent of the variance (see Figure 26). In comparison, the middle income group reported the highest R at .505 with an R Square reporting 25 percent of the variance. The predictive ability of the Learning Strategy section was still much stronger for the high income group than it was for the low income group, which was weaker than the middle income group. For the high income group, R reported .303 with R square reporting nine percent of the accountable variance. *Effort Regulation* accounted for all of the variance of the subscales for all three income groups (see Figures 19 and 20).

Figure 26
Model Summary (by group*)*
Learning Strategies Regression
Stepwise Entry

Low Middle High Self-report	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Low Income	1	.266(a)	.071	.061	1.08052
Middle Income	1	.451(a)	.204	.191	.92843
	2	.505(b)	.255	.231	.90515
High Income	1	.303(a)	.092	.087	1.17180

a Predictors: (Constant), *Effort Regulation*
b Predictors: (Constant), *Effort Regulation , Peer Learning*

Figure 27
Variables Entered/Removed(a)
Learning Strategies Regression
Stepwise Entry

Low Middle High Self-report	Model	Variables Entered	Variables Removed	Method
Low Income	1	Effort Regulation	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
Middle Income	1	Effort Regulation	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
	2	Peer Learning	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
High Income	1	Effort Regulation	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a Dependent Variable: Class Grade Numeric

Figure 28
ANOVA(c) (by group)
Learning Strategies Regression
Stepwise Entry

Low Middle High Self-report	Model		Sum of Squares	df	Mean Square	F	Sig.
Low Income	1	Regression	8.427	1	8.427	7.218	.009(a)
		Residual	110.916	95	1.168		
		Total	119.342	96			
Middle Income	1	Regression	13.657	1	13.657	15.843	.000(a)
		Residual	53.443	62	.862		
		Total	67.100	63			
	2	Regression	17.123	2	8.561	10.449	.000(b)
		Residual	49.977	61	.819		
		Total	67.100	63			
High Income	1	Regression	26.274	1	26.274	19.135	.000(a)
		Residual	259.519	189	1.373		
		Total	285.793	190			

a Predictors: (Constant), *Effort Regulation*
b Predictors: (Constant), *Effort Regulation* , *Peer Learning*
c Dependent Variable: Class Grade Numeric

As with the Motivation section, a regression analysis of the data was conducted using a Backward entry method. The results again do not add to the understanding gained, but the exercise does help to further illustrate the possible effects income can have on the predictive ability of the Learning Strategy section of the MSLQ.

Figure 29
Model Summary (by group)
Learning Strategies Regression
Backwards Entry

Low Middle High Self-report	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Low Income	1	.362(a)	.131	.063	1.07935
	2	.361(b)	.130	.072	1.07390
	3	.359(c)	.129	.081	1.06885
	4	.353(d)	.125	.087	1.06559
	5	.332(e)	.110	.081	1.06872
	6	.297(f)	.088	.069	1.07607
	7	.266(g)	.071	.061	1.08052
Middle Income	1	.551(h)	.304	.217	.91347
	2	.550(i)	.302	.229	.90619
	3	.547(j)	.299	.238	.90074
	4	.537(k)	.289	.240	.89951
	5	.523(l)	.274	.237	.90130
	6	.505(m)	.255	.231	.90515
High Income	1	.348(n)	.121	.088	1.17149
	2	.347(o)	.121	.092	1.16865
	3	.346(p)	.120	.096	1.16619
	4	.340(q)	.115	.096	1.16581
	5	.329(r)	.108	.094	1.16733
	6	.310(s)	.096	.087	1.17211
	7	.303(g)	.092	.087	1.17180

a Predictors: (Constant), *Critical Thinking, Help Seeking, Effort Regulation, Rehearsal, Peer Learning, Elaboration, Organization*
b Predictors: (Constant), *Critical Thinking, Effort Regulation, Rehearsal, Peer Learning, Elaboration, Organization*
c Predictors: (Constant), *Critical Thinking, Effort Regulation, Rehearsal, Peer Learning, Elaboration*
d Predictors: (Constant), *Critical Thinking, Effort Regulation, Rehearsal, Elaboration*
e Predictors: (Constant), *Critial Thinking, Effort Regulation , Elaboration*
f Predictors: (Constant), *Critical Thinking, Effort Regulation*
g Predictors: (Constant), *Effort Regulation*
h Predictors: (Constant), *Critical Thinking, Help Seeking, Rehearsal, Effort Regulation, Organization, Peer Learning, Elaboration*
i Predictors: (Constant), *Help Seeking, Rehearsal, Effort Regulation, Organization, Peer Learning, Elaboration*
j Predictors: (Constant), *Rehearsal, Effort Regulation, Organization, Peer Learning, Elaboration*
k Predictors: (Constant), *Rehearsal, Effort Regulation, Peer Learning, Elaboration*

l Predictors: (Constant), *Effort Regulation, Peer Learning, Elaboration*
m Predictors: (Constant), *Effort Regulation, Peer Learning*
n Predictors: (Constant), *Critical Thinking, Effort Regulation, Help Seeking, Organization, Peer Learning, Rehearsal, Elaboration*
o Predictors: (Constant), *Critical Thinking, Effort Regulation, Help Seeking, Organization, Peer Learning, Elaboration*
p Predictors: (Constant), *Critical Thinking, Effort Regulation, Help Seeking, Organization, Peer Learning*
q Predictors: (Constant), *Effort Regulation, Help Seeking, Organization, Peer Learning*
r Predictors: (Constant), *Effort Regulation, Help Seeking, Peer Learning*
s Predictors: (Constant), *Effort Regulation, Help Seeking*

Part III: Multivariate Analysis/Analysis of Variance

Research question three asks if successful academic motivational and/or study skills profiles significantly differ between low, middle, and high income student populations. A MANOVA was conducted to answer question three. This study conducted an analysis of the mean scores to test for significant differences in both the Motivation and Learning Strategy sections. It was hoped that conducting this analysis would uncover either one or more subscales that significantly differ along income lines and thus support the hypothesis that motivational preferences do exist within the tested populations. Given prior research (Pintrich, 2003), it is possible low income students will assign more value to one or more of the theoretical subscales than will middle or high income students.

This study conducted comparisons using a MANOVA. Pintrich (2003) held that an analysis of the individual subscale mean scores of the various sub-populations might yield useful information for creating intervention programs. It was hypothesized (Pintrich, 2003) the results of a mean score analysis of the MSLQ should result in different patterns of high and low subscale mean scores for minority students. Given the shared variance of income and minority status established by the U. S. Department of Education (National Assessment of Educational Progress, 2003), it was hoped that

different patterns in the mean scores would also manifest themselves along income lines. Unfortunately, not enough minority students were represented to make meaningful comparisons along ethnic lines.

Results of the MANOVA Analysis Reviewed

A quick check of the mean scores chart (see Figure 30) offers no real evidence that large differences exist. Further analysis of the mean scores revealed that few, if any, significant differences existed between low, middle, and high income bands in either the mean scores of the Motivation or the Learning Strategy section. Although MANOVA results using Wilks' Lambda and Hotelling's Trace do show that there are significant differences in the Motivation section (see Figure 31), further post hoc analysis using both Bonferroni and Dunnett C reveals that only the mean scores of subscale *Task Value* (see Figure 32) significantly differ along income lines.

Figure 30
Descriptive Statistics
Mean Scores Chart

Low Middle High Self Report		N	Minimum	Maximum	Mean	Std. Deviation
Low Income	Cumulative GPA	101	.00	4.00	2.8834	.85683
	Semester GPA	101	.00	4.00	2.7397	1.04368
	Class Grade Numeric	101	1.00	5.00	3.7654	1.11258
	Valid N (listwise)	101				
Middle Income	Cumulative GPA	65	.00	4.00	2.9017	.83320
	Semester GPA	65	.00	4.00	2.8200	.97105
	Class Grade Numeric	65	1.00	5.00	3.8303	1.02416
	Valid N (listwise)	65				
High Income	Cumulative GPA	199	.00	4.00	2.7391	.90931
	Semester GPA	199	.00	4.00	2.6169	1.08111
	Class Grade Numeric	199	1.00	5.00	3.4429	1.23420
	Valid N (listwise)	199				

Further Comparisons Using the Learning Strategies Section

No significant differences in the mean scores were observed in the Learning Strategies section of the MSLQ.

Figure 31
Multivariate Tests(c) Motivation Section
MANOVA

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept							
	Wilks' Lambda	.026	2606.582(a)	5.000	349.000	.000	.974
	Hotelling's Trace	37.344	2606.582(a)	5.000	349.000	.000	.974

a Exact statistic
b The statistic is an upper bound on F that yields a lower bound on the significance level
c Design: Intercept+VAR00004

Figure 32
Post Hoc Comparisons Motivation Section MANOVA Motivation Section

Task Value	Bonferroni	Low Income	Middle Income	.2703	.23240	.737	-.3463	.8869
			High Income	.4794(*)	.17811	.022	.0068	.9520
		Middle Income	Low Income	-.2703	.23240	.737	-.8869	.3463
			High Income	.2091	.20911	.954	-.3457	.7639
		High Income	Low Income	-.4794(*)	.17811	.022	-.9520	-.0068
			Middle Income	-.2091	.20911	.954	-.7639	.3457
	Dunnett C	Low Income	Middle Income	.2703	.22967		-.3437	.8844
			High Income	.4794(*)	.16708		.0378	.9210
		Middle Income	Low Income	-.2703	.22967		-.8844	.3437
			High Income	.2091	.21903		-.3757	.7938
		High Income	Low Income	-.4794(*)	.16708		-.9210	-.0378
			Middle Income	-.2091	.21903		-.7938	.3757

Chapter Summary

The validation exercise conducted in part 1 suggests that with minimal changes, the MSLQ could be as strong an instrument with a community college population as with a primarily research college student population. However, regression analysis revealed that the MSLQ has a weak predictive ability for GPA. When both the Motivation and the Learning Strategy sections are included, R only reports .392 with R square explaining 15 percent of the accountable variance using the dependent variable class grade.

Part two of the study sought to unearth evidence that socioeconomic background

does have a significant contextual impact on one's academic motivational and study skills development. Further regression analysis of low, middle, and high income groups suggests the predictive strength of the MSLQ is weakest for low income students and strongest for middle and high income students. Most notably, the low income group failed to reach significance on any of the subscales, whereas the predictive ability increased dramatically for both the middle and high income student groups. The Learning Strategy section's predictive ability was also influenced by income, but to a lesser degree.

A MANOVA of the mean scores revealed that only the motivational sub- item *Task Value* significantly differed along income lines, which suggests the mean scores are not largely influenced by income. Further discriminant analysis of both sections indicated that only the Motivation section can significantly predict group membership. However, the differences are so intermingled that little if any real knowledge can be gained by the examination of the mean scores of the economic subgroups.

CHAPTER 5

CONCLUSION

Summary of Research

Students from low income families lag behind their upper and middle class counterparts in terms of academic achievement (Mortenson, 2004). The problem of how to address the issues faced by low income students takes on a new significance as the numbers of low income students attending college increase. Early identification and intervention continues to remain the best and most widely recommended solution. Although prior academic achievement remains the most common method of identifying potential at risk students, the appraisal of one's academic skill alone misses a large percentage of the variance when predicting student retention. The dilemma is often that students who would succeed on their own are targeted for intervention programming, while those who need assistance do not immediately appear through academic screening designed to identify at risk students and eventuallyfall through the cracks.

A growing body of research indicates that motivation and the use of certain study skills methods, may be two likely alternative predictors of student success. The Motivated Strategies for Learning Questionnaire (MSLQ) is a recently developed instrument that strongly links motivation and the use of various learning strategies (e.g. study skills) to GPA. However, until now the instrument has not been used to ascertain whether socioeconomic background significantly affects scoring patterns within the six Motivational scales and the nine Learning Strategy scales.

Purpose and Methodology

The purpose of this study was to first re-establish factorial validity of the MSLQ and assess its predictive strength for low, middle and high income students and then evaluate if academically successful motivational and study skills profiles differ along income and ethnic lines.

The study was divided into three parts. The first part of the study sought to evaluate the factorial structure of the MSLQ when applied to a community college student population. Part two of the study conducted a series of regression analyses to answer two research questions: 1) does the MSLQ significantly predict GPA performance among low, middle and high income student populations; and 2) does the strength of the predictive ability of the MSLQ significantly differ among low, middle and high income student populations? The third part of the study, conducting a MANOVA sought to answer research question three, whether significant differences exist between the group's mean scores for both students from low socioeconomic backgrounds and for students from ethnically diverse backgrounds. The goal of the regression analysis and the MANOVA was to determine whether there was evidence to suggest that socioeconomic background does have a significant contextual impact on one's motivational and study skills development.

Results

Part I: Factorial Validity

Results of the factor analysis suggest that with minimal changes, the MSLQ could have as strong a factorial validity with a community college population as with the primarily research one college student population used in the original study. However, as

explained below, without modification the instrument runs the risk of providing inaccurate results to both the student and the practitioner who might use the data collected from the instrument to make program decisions.

Confirmatory factor analysis of the motivation section of the MSLQ revealed that although recognizable groupings emerged within all but one of the motivation items, *Intrinsic Goal Orientation* lost its independent factor validity and loaded instead on *Task Value* and *Self Efficacy for Learning and Performance*. This suggests factor validity is a problem with the *Intrinsic Goal Orientation* questions; the questionseither had different meanings for the students, or the subscale is poorly constructed. In any case, factor validity for the *Intrinsic Goal Orientation* items are in question. For this reason, *Intrinsic Goal Orientation* items was excluded from all further analysis in this study.

Excludingall of the *Intrinsic Motivation* items and the rogue question, two of the *Control Beliefs About Learning* items thatdo not maintain group cohesion strengthens the factor validity on the Motivational scale. Chi-Square is relatively high and many of the individual factor loadings in the corrected model continue to be well below .7. Although the loadings continue to be weak, the loadings reported in the original testing guide were weak also (Pintrich et al., 1991). The resulting gain allows for factor validity to be reasonably claimed and the study to continue with more meaningful comparisons of the motivation differences that may possibly fall along income lines.

Although recognizable groupings emerged within the Study Strategies section, two of the subscales, *Time and Study Environment* and *Metacognitive Self Regulation*, load randomly enough to discredit their recommendation for future use without either deleting some questions or modifying how the results are reported to each student.

In fact, five subscales, *Rehearsal, Elaboration, Organization*, *Critical Thinking*, and *Effort Regulation*, all have at least one question that loaded on a different component. For the purposes of this study, these questions were deleted altogether. Other items such as *Peer Learning* and *Help Seeking* load on top of each other. These subscale items were deleted from further evaluation in this study as well.

When the Learning Strategies section was reduced from nine factors to six factors, sampling adequacy only dropped from .918 to .879, while Chi-Square changed from 8.59 to 3.08, which was in range with 2.26 reported in the range MSLQ testing guide. The resulting gain allowed for factor validity to be reasonably claimed and the study to continue with more meaningful comparisons of Learning Strategy differences that may possibly fall along income lines.

It was originally hoped that further factorial comparisons could be made along income lines to see if factor analysis held up with each economic subgroup, but making further comparisons meant reducing N for each group to below half of what is recommended (Pedhazur, 1997) for meaningful comparisons. Despite this, the researcher did make further comparisons and observed that all but *Self Efficacy* lost its grouping cohesion with low income students; half of the factors from the high income group lost their grouping cohesion. Interestingly, despite the low N of the middle income group, factor groupings held with all but one variable. Results of the regression analysis reported in Chapter 4 suggest that some of the loss of factorial validity observed in the smaller sample comparisons could be due to the students'lack of understanding of the questions and not just the simple problem of restriction of range. Further research in this area using larger sample sizes needs to be conducted to establish if factorial validity is a problem

when administering the MSLQ to low income student populations.

Part II: Regression Analysis

Part two of the study conducted a series of regression analyses to answer two research questions: 1) does the MSLQ significantly predict GPA performance among low, middle, and high income student populations; and 2) does the strength of the predictive ability of the MSLQ significantly differ among low, middle, and high income student populations?

Regression analysis revealed the MSLQ had a weak predictive ability to GPA. When both the Motivation and the Learning Strategy sections were included, R only reported .392 with R square explaining 15 percent of the accountable variance using the dependent variable class grade. Further regression analysis of the predictability and variance addressed by the instrument along income lines revealed the MSLQ should probably not be recommended as an intervention tool for use with a campus population so heavily weighted with low income students. Given the multiple theoretical constructs included in the MSLQ and because the factor validity did remain as strong as it did in this study, the MSLQ still offers a uniquely strong instrument to use with comparisons of different campus groups.

When the MSLQ was divided into two sections, the learning strategy section was found to have a weak but significant predictive ability to GPA. R reported .331 with R Square accounting for 11 percent of the variance. *Effort Regulation* accounted for the total variance in this section. When the learning strategies section was divided by income band, predictability was significant for all three income bands, but much less significant for low income students than for middle and high income students. For the low income

group, R reported .266 with R Square accounting for seven percent of the variance. For the middle income group, R reported .505 with R Square accounting for 25 percent of the variance. For the high income group, R reported .303 with R Square accounting for nine percent of the variance.

The Motivation section, when taken separately, also was found to have a weak predictive ability for GPA. R reported .353 with R Square accounting for twelve percent of the variance. *Self Efficacy* and *Task Value* accounted for the total variance in this section. When theM otivation section was divided into low, middle and high income bands, it proved a much stronger predictor for middle and high income students, but was not predictive at all for low income students. In fact, none of the five Motivational subscales proved to be significantly correlated to GPA for the low income group. R reported .354 for the middle income group with R Square accounting for 12 percent of the variance. R reported .433 for the high income group with R Square accounting for 19 percent of the variance.

Part III: Multivariate Analysis/Analysis of Variance.

Research question three asked if successful academic motivational and/or study skills profiles significantly differed between low, middle, and high income student populations. This hypothesis was tested by conducting a multivariate analysis.

Pintrich (2004) held that an analysis of the individual subscale mean scores of the various subpopulations might yield useful information for creating intervention programs. It was hypothesized (Pintrich et. al. 1991) that the results of a mean score analysis of the MSLQ should result in different patterns of high and low subscale mean scores for minority students. Given the shared variance of income and minority status established

by the U.S. Department of Education (National Assessment of Educational Progress, 2003), it was hoped that different patterns in the mean scores would also manifest themselves along income lines. Unfortunately, not enough minority students were present in the study to make the same comparisons along ethnic lines.

Analysis of the mean scores revealed that few, if any, significant differences existed between low, middle, and high income bands in either the mean scores of the Motivation or the Learning Strategy section. Although MANOVA results using Wilks' Lambda and Hotelling's Trace did show significant differences in the Motivation section, further post hoc analysis using both Bonferroni and Dunnett C revealed that only the mean scores of the subscale *Task Value* significantly differed along income lines.

Limitations

Classification of Low/Middle/High Income Participants

One of the original challenges of this study was to find a way to separate the income bands into three groups: low, middle, and high. The proposal called for a self-report method where the student was asked if he or she had ever received a Pell grant, a subsidized student loan, or any financial aid assistance in that or a previous semester. It was recognized at the beginning the inherent weakness of self-report data could threaten the significance of any findings. The financial aid office at the host institution agreed to work with the college's IRB office to verify if and what form of financial aid assistance the student had requested. This allowed an objective and verifiable way of placing students into the low income band.

In all, 97 students were confirmed to have enough financial need as defined by the Expected Family Contribution (E.F.C.) formula to warrant Federal Pell Grant assistance

and therefore be considered low income. However, only 63 students who participated in the study could be categorized as middle income and only 54 students could be estimated as high income students by either the IRB or Financial Aid office records. The resulting middle and high income participant numbers were less than desirable for making meaningful comparisons. Although there was some ambiguity on what students reported about their financial aid, the data for high income students, defined as students who did not receive federal financial aid assistance, remained largely unchallenged. It became apparent there was no way to verify if a student was truly a high income student or simply a low or middle income student who had not applied for financial aid.

In an effort to retain larger numbers for middle and high income students in the study, self-report data was merged with the high income student data. The new database classified as low income only those students who were verified as low income, based upon their financial aid records. Students classified as middle income were classified as such based upon questionnaires previously collected by the host institution, which identified them as middle income students. For high income students, the classification was made based largely upon self-report data. The resulting database gave an accurate representation of low income students, a somewhat less accurate representation of middle income students, and a largely self-report estimate of high income students. Side-by-side comparisons of the results using both the combined and verified-estimated database were done to ensure the inclusion of the self-report data would strengthen the high income study.

Substitution of Class Grade Dependent Variable

Prior research suggests that the MSLQ has the strongest predictive relationship with class grade as a dependent variable (Pintrich et al.,1991). This study's results suggested the end of semester class grade had the strongest predictive association with the MSLQ and it was thus chosen as the dependent variable for analysis in this study.

Twenty of the 364 students who were included in this study withdrew from the class before the end of the semester. Listwise exclusion would have omitted all of the students who withdrew from the study and could have threatened the accuracy of the results. Replacing the withdraw grade with the group mean would solve this problem but would not be as accurate as simply replacing the missing 20 class grades with either the semester or cumulative GPA. Therefore, the semester or cumulative GPA was inserted for these 20 students. The differences in predictability between class grade, semester GPA, and cumulative GPA was low.

Inadequate Male Participation

The student population had a higher percentage of female participants than it did male, thus possibly influencing the results of the study. The ratio of male students to female students at the host institution is 60 percent male, 40 percent female, but in this study the ratio of participating female students to participating male students was 71 percent to 28 percent, respectively. It was noted by the researcher that males were more likely to self-select out of the study once given the option to do so.

Inadequate Minority Participation

Although the minority population in the study was very reflective of the host campus population, it was disappointing not to be able to make any meaningful

comparisons along ethnic lines. Nine percent (N=36) of the students self identified as Hispanic, heading up the largest minority group in the study. African American students made up just 2.1 percent of participants (N=8). Seven students identified themselves as Asian American. Only three students who participated in the study identified themselves as Native American. In contrast, 82 percent (N=314) of the students identified themselves as white. Further research needs to be conducted to explore the relationships between economic circumstance, cultural background, and academic success.

Analysis of Results

Findings

The study has re-established factor validity for the population of students who participated in this study. The study has also established that the MSLQ is less useful as a predictor of GPA for low income students than it is for middle and high income students. The lack of predictive ability suggests that one or more unidentified confounding variables exist that hinder the MSLQ from being as predictive for low income students as it is for middle and high income students. A MANOVA of the mean scores revealed only the Motivational sub-item *Task Value* significantly differed along income lines, which suggests that the mean scores are not largely influenced by income. Further discriminant analysis of both sections indicated that only the Motivation section could significantly predict group membership. However, the differences were so intermingled that little if any real knowledge can be gained by the examination of the mean scores of the economic subgroups.

Because there is no difference in the scoring patterns of the students along income lines, by process of elimination we can conclude that the low income students in this

study both understood and then responded to the questions in the MSLQ in the same patterns as their middle and high income counterparts. Further examination of the differences in the mean scores also suggests there were no real differences between the three groups in how they responded to the instrument, thus suggesting that if all in life were equal—no confounding variables outside of the instrument—lowincome students who were administered this survey would most likely be found to be engaging in similar academic behavior. Although the MANOVA results that examined the differences along the mean scores of the MSLQ were not significant, the lack of findings potentially tells the researcher as much information as if the results were significant. In essence, considering the non-significant results allows the researchers to isolate confounding variables that cause the loss of predictive ability of the MSLQ for low income students to causes outside of the theoretical scope of the instrument.

Implications

Many studies to date have looked at the relationship between motivation and academic success for "general population" (predominantly white, middle, and high income) students (Carey, 2000). Many more studies have established relationships between economic background, academic achievement as measured by GPA, and persistence to degree completion (Tinto, 1993). Although several studies identify one or more low income student populations as high risk in terms of not completing their educational goals (Pascarella, Pierson, Wolniak, Terenzini & Patrick, 2004), Pintrich (2004) points out that few studies explore the potentially profound role socioeconomic background may play in a student's academic interests, motivation, and problem-solving ability, all of which influence persistence.

Although no real differences in this studywere observed along the mean scoring patterns of the three income groups, large differences were found in the predictability of the MSLQ along income lines. The Motivation section of the MSLQ failed to reach significance in any of the five subscales tested. In comparison, the predictability of the Motivation section of the MSLQ increased with the middle and high income group. Although the Learning Strategies section had significant results for all income groups, predictive differences were observed. This suggests that confounding variables exist that prohibit the MSLQ from being as useful for low income students as it is for middle or high income students. The results of this study thus lend credibility to Kitayama (2002) and Tangney and Leary's (2003) argument that an individual's contextual characteristics do play a significant role in the development of his or her motivational and/or cognitive learning. The results of this study help to illustrate the pitfalls of adhering to a single traditional method of delivering curriculum. It may be as Kitayama (2002) holds, that low income students have value systems that are so markedly different from the value systems held by middle and high income students that the factors which naturally make some students perform to their best potential are overlooked by those capable of effecting change. The reason for this may be that the collegium themselves are also members of the middle or high income groups and thus share that value system.

However, the results of this study do not support Pintrich's (2002) assumption that motivation or learning strategies are influenced by contextual differences in one's income background. Unfortunately, not enough minority students were present in the study to test if significant differences in the subscale mean scores would manifest themselves along ethnic lines. A different instrument or methodology might better

examine these possible differences.

Possible Explanations

It would be interesting to include ACT or SAT scores with the administration of this instrument to ascertain how much of the variance could be explained by measuring the academic skill with which the students began college. It would also be interesting to check the mean scores of the ACT as divided along the income groups to see if low income students entered the institution with less developed academic skills than their middle and high income counterparts. However, prior research (Mortenson, 2004) suggests that ACT scores are impacted by income. It is reasonable to assume that this would be the case with the student population in this study. However, if academic skills were the confounding variable, that would account for the lack of predictive ability of the MSLQ for low income students and one would expect to see differences in the three GPA mean scores. As seen in Figure 30, the three mean GPA scores in this study are also tightly grouped together. In fact, if one were to compare the smallest of margins, the low income group scored higher than the high income group but not higher than the middle income group. This in part suggests the academic skill of the three groups is not the confounding variable causing the loss of predictability of the MSLQ for the low income student group. So what is causing the MSLQ to be less predictive for low income students than it is for the middle or high income student? Again, the answer most likely lies outside of what was to be measured in the motivation and learning strategies sub-items in this study.

There are many possible explanations for what could be the confounding variable responsible for the study's results for low income students. One possibility is that low

income students simply do not have enough money to attend college. Research indicates that federal and state governments have been negligent in offering adequate financial assistance to students from low income backgrounds (Melvin & Stick, 2001). Other research (Beegle, 2000) suggests that students from low income backgrounds simply live a different economic reality than middle class students. Beegle (2000) holds that the amount of effort needed to navigate the economic realities of students experiencing generational poverty can and does often outpace a student's motivation and expectations for academic achievement. For instance, Beegle (2000) found that:

> The focus of life is on subsistence issues: Where will we sleep tonight? What will we eat? Can we find a way to keep our heat or lights turned on? People born into a middle-class reality tend to focus on self-development: What is the best education possible? What extra-curricular activities will enhance reaching their full potential? What is the best health care plan? What is the best neighborhood? The context in which we are born and grow up shapes our view of what is possible, our values, and our world-view. (http://www.combarriers.com/about_donna.php)

It is completely plausible that many of the differences Beegle (2000) found in her research on low income children follow a student into college. Although not all low income college students who are eligible for Pell grant assistance come from the dire economic backgrounds Beegle portrays, it is easy to imagine that even a small amount of exposure to the potentially harsh realities of need could easily outstrip any motivational or learning strategies methods the collegium might seek to teach.

Another possible explanation is that the college environment is daunting to students from low income backgrounds. Some researchers conclude that campus environments are not hospitable enough, often making students from underrepresented groups feel unwelcome or unincluded, and thus increasing the stress and anxiety these students experience during the transition to college life (Tinto, 1993). Strange and

Banning (2001) propose the concept that the institutional pressure brought on by subtle influences of campus ecology influences many students to stay or leave. At the host institution as on many campuses, student services initiatives are underway to reduce the campus pressure (Taft, Kyle 2005). Recent initiatives included on the campus used for this study include a "one-stop student services shop," placing registration, financial aid, the advisement center and the business office in one building, reducing the pressure often inflicted needlessly upon students who are navigating higher education for the first time.

Perhaps it is what happens inside the classroom itself that is the confounding variable for students from low income backgrounds. Other researchers have concluded the learning environment created within higher education's predominant reliance on memorization skills fostered by the lecture method of teaching leads many students to disengage and ultimately question the value of what is being taught to them (Pascarella et al., 2004). Beegle (2003) found those students who do succeed often do so out of a sense of obligation or duty, spurned on by mentoring relationships with those who either hold an academically supportive value system or with someone who is affiliated with the institution. Beegle (2003) echoes this sentiment, commenting thatdespite students reporting that academics came easily to them, 94 percent of the students surveyed in her 2002 research reported that teachers did not know what to do with them.

Finally, it is possible that the confounding variable is the type of coping skills some low income students have developed in order to deal with their economic reality. For example, Pascarella et al. (2004) observe that some students seem to adjust more swiftly to changing situations and are better able to handle the academic and social pressure of college than others. Those who do not persist are in most cases as

academically strong as their persisting classmates but tend to be less mature, emotionally stable, and less flexible and adaptive to the new circumstances that higher education has to offer. Beegle (2003) suggests that

> In America, we socialize people to believe you have to have a certain kind of shoe, you have to have a certain kind of clothing, you have to have a certain kind of house, you have to drive a certain kind of car, and you have to have a certain kind of job. And, if you don't have those things, you are not normal and you don't belong. And this is why you see a lot of families from generational poverty with a cell phone, or a big screen, or cable, when we know they can't even afford to pay their rent. What we tend to do is judge them and say well, "They're irresponsible". "I wouldn't do that kind of thing!" But the reality is they are trying to belong, and if you picture that scenario of a parent with 2 children living on $468/month, they don't have enough money anyways, and they want their kid to belong, so they will say, "Get your starter jacket" or "Get your Nike's", or whatever it is that would seem to help them to belong." (http://www.nwrel.org/nwedu/10-04/beegle/)

Because of the outside obstacles Beegle (2000) describes, it is reasonable to assume students from low income backgrounds need to dig deeper than what is normally needed to succeed in the classroom. The value system developed by a student's family to deal with the reality of their individual economic circumstances may be a telling predictor of academic success. From this perspective, one could argue the value systems developed by families from high income backgrounds will mesh with the value systems generally espoused by the collegium (Kitayama, 2002). Students from minority groups traditionally caught in the bands of poverty have the added pressure of replacing old systems that are less functional within the college culture with more functional systems (Pascarella et al., 2004). For some, becoming academically successful—as defined by GPA and persistence to degree completion—means changing value and behavioral patterns often held by their peers and/or immediate family members (Tinto, 1993).

Chapter Summary

Although the predictive ability of the MSLQ proved to be weak overall, the results of the study suggest that the predictive strength of both the Motivation and the Learning Strategies sections was influenced by a student's economic background. None of the motivation subscales reached significance for the low income group of students. In contrast, the predictability of the instrument increased dramatically for both the middle and high income groups. Although most of the subscales of the Learning Strategies section did reach significance, the predictive strength to the dependent variable, GPA, was still much less for low income students than it was for middle and high income students.

Given prior research (Pintrich, 2003), one would expect that any major differences would manifest themselves in the mean scores of the three groups. However, in this portion of the study, only *Task Value* proved to be marginally affected by income background. None of the other 11 tested subscale mean scores proved to be significantly different from one another. Results of the confirmatory factor analysis suggest thatfactor validity for the MSLQ can be reasonably claimed for this community college student population, once the three subscales that did not maintain their factorial integrity (*Goal Orientation*, *Time and Study Environment,* and *Metacognitive Self Regulation)* were taken out of the study. Comparisons of the results of this portion of the study with the original validation study cited in the MSLQ testing guide suggest that similar, though less predictive, results were achieved with this study. Further research is recommended to ascertain if the MSLQ and other like motivational instruments are affected by income background.

Interpretation of the results of the study concluded confounding variables isolated outside of what the MSLQ intended to measure were responsible for the loss of predictability of the Motivation section for the middle income group. There are several possible explanations for what might be the confounding variable, such as financial resources, campus and classroom environments, coping skills, and perhaps others. Future research needs to be conducted to ascertain if such contextual differences are indeed the confounding variable found in this study and if income has similar effects on the predictability of other motivational instruments in other settings.

REFERENCES

Allen, D. (1999). Desire to finish college: An empirical link between motivation and persistence. *Research in Higher Education, 40(4)*, 461-485.

Astin, A. W. (2003, July 3). Studying how college affects students. *About Campus, 8(3)*, 21-29.

Astin, A. W. (1999, Spring 2). Rethinking academic excellence. *Liberal Education, 85(2)*, 3-33.

Astin, A. W. (1999). Involvement in learning "revisited": Lessons we have learned. *Journal of College Student Development, 40(5)*, 587-598.

Astin, A.W. (1994). *Minorities in American higher education: Recent trends, current prospects and recommendations.* San Francisco: Jossey Bass.

Bandura, A. (2002). Selective moral disengagement in the exercise of moral agency. *Journal of Moral Education, 31(2)*, 101-119.

Beegle, D. (2000). *Interrupting generational poverty: Experiences affecting successful completion of a bachelor's degree.* Oregon: Portland State University.

Beegle, D. (2003). Overcoming the Silence of Generational Poverty. [Electronic version]. *Talking Points, 15(1),* 11-20.

Benson, J. (1998). Motivated strategies for learning questionnaire. In *Mental Measurements Year Book* (13th ed., pp. 680-682). The University of Nebraska-Lincoln: The Buros Institute of Mental Measurements.

Brown, A. (1997). Transforming schools into communities of thinking and learning about serious matters. *American Psychologist,* 399-413.

Carey, C. E. (2000). Academic achievement motivation in African American college football players: An investigation of educational expectations and values. *UMI.* Bell & Howell Information and Learning Company, Ann Arbor, MI. (UMI No. 9968565).

Flowers, L. A., & Pascarella, E. T. (2003). Cognitive effects of college: Differences between African American and Caucasian students. *Research in Higher Education, 44,* 21-49.

Getting to "why" .to solve for "how": kids in poverty now on our radar. *Northwest Education*. Retrieved March 4, 2006, from http://www.nwrel.org/nwedu/10-04/beegle/

Gurin, P., Lehman, J. S., & Lewis, E. (2004). *Defending diversity: Affirmative action at the University of Michigan*. (Vol. 251). New York: Publishers Weekly.

Heckhausen, J., Dweck, C. S. (1998). *Motivation and self-regulation across the life-span.* New York: Cambridge University Press.

Kitayama, S. (2002). Culture and basic psychological processes. *Psychological Bulletin,* 89-96.

Kolodny, A. (1998). *Failing the future.* (2nd ed.) Durham NC: Duke University Press.

Markus, H., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion and motivation. *Psychological Review,* 224-253.

McKeachie, W. J. (2001). *McKeachie's teaching tips.* (11th ed.) Boston MA: Houghton Mifflin Company.

Melvin, M., Stick, S. (2001). The causes and consequences of the federal student aid policy: Shift from grants to loans. *Journal of College Orientation and Transition, 9(1)*, 44-55.

Mortenson, T. (2004, May). Family income and higher education opportunity 1970 to 2002. (143rd ed.) (Available from Postsecondary Education Opportunity, www.postsecondary.org)

National Assessment of Educational Progress. (2003). The nation's report card. *U.S. Department of Education.* Abstract retrieved October 26, 2004, from http://nces.ed.gov/nationsreportcard/

National Center for Educational Statistics. (2004). Projections of education statistics to 2013. *U.S. Department of Education* Retrieved October 26, 2004, from http://nces.ed.gov//programs/projections/ch_2.asp#1

Pascarella, E. T., Pierson, C. T., Wolniak, G. C., & Terenzini, Patrick, P. T. (2004). First generation college students. *Journal of Higher Education, 75(3)*, 249-236.

Pedhazur, E. J. (1997). *Multiple regression in behavioral research* (3rd ed.) Orlando FL: Harcourt Brice College Publishers.

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology, 95(4)*, 0022-663.

Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review, 16*(December), 385-407.

Pintrich, P. R., & Smith, D. A. (1993). Reliability and predictive validity of the motivated strategies for learning questionnaire (MSLQ). *Educational & Psychological Measurement, 53(3)*, 801-813.

Pintrich, P.R., Smith, D.A., Garcia, T., & McKeachie, W.J. (1991). A manual for the use of the motivated strategies for learning questionnaire No. 91-B-004.

Reeve, J., Nix, G., & Hamm, D. (2003). Testing models of the experience of self-determination in intrinsic motivation and the conundrum of choice. *Journal of Educational Psychology, 95(2)*, 375-392.

Snow, R. E., & Jackson, D. N. (1994). Individual differences in conation: Selected constructs and measures. *Motivation: Theory and Research,* 71-99. Hillsdale: Lawrence Erlbaum Associates.

Strange, C. C. & Banning, J.H. (2001). *Educating by design: Creating campus learning environments that work.* California: Jossey-Bass.

Tangney, J., & Leary, M. (2003). *Handbook of self and identity.* New York: Guilford Press.

Tinto, V. (1993) *Leaving college: Rethinking the causes and cures of student attrition.* Chicago: University of Chicago Press.

Tremblay, P. F. (1999). Development and construct validation of the academic motivation inventory. *University Microfilms International, 59*(9B). Dissertation Abstracts International: Section B: The Sciences & Engineering.

Tyack, D. B., & Cuban, L. (1999). *Tinkering toward Utopia*. (6th ed.) Cambridge MA: Harvard University Press.

Whitt, E. J., Pascarella, E. T., Nesheim, B. S., Marth, B. P., & Pierson, C. T. (2003). Influences on students' openness to diversity and challenge in the second and third years of college. *Journal of College Student Development, 44,* 587-610.

Zea, M. C., & Reisen, C. A. (1997). Predicting intention to remain in college among ethnic minority and nonminority students. *Journal of Social Psychology,* 137(2), *149-161.*

APPENDICES

Number _____

Motivated Strategies for Learning Questionnaire (MSLQ) Consent Form

Investigator: David Wilson, Oklahoma State University

(Consent Form is to be collected by the designated Institutional Review Office Official)

About the MSLQ:

This study is part of a doctoral dissertation study researching several aspects of college teaching and learning. Scores will potentially give the institution valuable information about typical study habits, learning skills and motivation required to successfully complete this class. In addition, the researcher will seek to compare information collected from the enclosed demographic sheet and financial aid records to contrast scoring differences that may exist along socio-economic lines. Results from this portion of the study could help us better understand how to tailor future learning environments to fit the needs of all students.

Your rights as a participant of this study:

Participation in the study is voluntary but greatly appreciated. As part of this study you are asked to fill out the Motivated Strategies for Learning Questionnaire, the included demographic information sheet and the consent form giving the host institution's Institutional Review office the permission to access your grade and any financial aid participation. This information will be reported to the researcher only in the form of the packet number found in the upper right hand corner of the Consent From, Demographic Sheet and the MSLQ. This will become your study identification number. At any time you have the right to withdraw or refuse to answer any questions. The Process should take no more than twenty minutes to complete. If you have further questions about your rights as a participant, please contact the researcher, Internal Review Board (IRB), the host institution's office or the IRB chair person at Oklahoma State University. listed in the enclosed contact sheet.

Number _____

Results of the study:

Because no information will be available until some time in spring 2006, no follow-up information will be given to you about your individual MSLQ results unless you make a request in writing within one year from the Institutional Review office at host institution. The contact information, included in the enclosed sheet, is yours to take. If you have further questions or concerns about this study, or seek to obtain your individual results, please feel free to contact the researcher or the host institution's Institutional Review office.

Security measures in place to protect your personal information:

If you choose to participate in this study, your grade and financial aid information will be accessed by the host institution's Institutional Review office at the end of this semester. The host institution's Institutional Review office will only report this information to the researcher as the participant number listed in your MSLQ packet. Unless you request your MSLQ results, the researcher will only be able to identify a subject of this study by the MSLQ packet number. The researcher will not have access to the participant's name, student identification number or social security information.

Please sign below if you would like to be involved in this study

Name (print) _____

Signature_____

Student ID or Social Security Number_____

Today's Date_____

Thank you again for your participation

(Contact sheet is to remain with the participant of the study)

Contact Sheet

If you have questions about the research project, or to request your individual results of the MSLQ, contact either the researcher, David Wilson, or Kim Purdy at theHOST INSTITUTION Institutional Research Office. If you have further questions or concerns about your rights as a participant in this study please contact the IRB Chair Person at Oklahoma State University.

Contact Information:

Brian David Wilson (Researcher)
Upward Bound Academic Coordinator
HOST INSTITUTION
One College Drive
Bentonville. Arkansas 72712

Phone # 479-619-2271

HOST INSTITUTION IRB Office
Kim Purdy
Director of Institutional Research
HOST INSTITUTION
One College Drive
Bentonville, Arkansas 72712

Phone # 479-479-4399

Dr. Linda Dayton
Executive Vice President
HOST INSTITUTION
One College Drive
Bentonville, Arkansas 72712

Phone # 479-479-4235

IRB Chair Person
Dr. Sue Jacobs
415 Whitehurst
Oklahoma State University
Stillwater, OK 74078

Phone # 405-744-1676

(To be read to the participants before they begin the MSLQ)

MSLQ Recruiting Script HOST INSTITUTION

This study in part seeks to better understand several aspects of college teaching and learning. Your scores will potentially give the institution valuable information about typical study habits, learning skills and motivation required to successfully complete this class. In addition, the researcher will seek to compare information collected from the enclosed demographic sheet and financial aid records to contrast scoring differences that may exist along socio-economic lines. Results from this portion of the study could help us better understand how to tailor future learning environments to fit the needs of future students.

Participation in the study is voluntary but greatly appreciated. As part of this study you are asked to fill out the Motivated Strategies for Learning Questionnaire, the included demographic information sheet and the consent form giving the HOST INSTITUTION Institutional Review office the permission to access your grade and any financial aid participation. This information will be reported to the researcher only in the form of the packet number found in the upper right hand corner of the consent form, Demographic Sheet, and the MSLQ. This will become your study identification number. At any time you have the right to withdraw or refuse to answer any questions. The process should take no more than twenty minutes to complete. If you have further questions about your rights as a participant please contact the researcher, IRB HOST INSTITUTION office, or the IRB chair person at Oklahoma State University, who are listed in the enclosed contact sheet.

Because no information will be available until some time in the spring 2006, no follow-up information will be given to you about your individual MSLQ results unless you make a request in writing within one year to the Institutional Review office at HOST INSTITUTION. The contact information, included in the enclosed sheet, is yours to keep. If you have further questions or concerns about this study or seek to obtain your individual results, please feel to contact the researcher or HOST INSTITUTION Institutional Review office. Individual results will not be available until late in the spring 2006 semester.

If you choose to participate in this study, your grade and financial aid information will be accessed by the HOST INSTITUTION Institutional Review office at the end of this semester. The HOST INSTITUTION Institutional Review office will only report this information to the researcher as the participant number listed in your MSLQ packet. Unless you request your MSLQ results, the researcher will only be able to identify a subject of this study by the MSLQ packet number found in the upper right hand corner of the MSLQ, Demographic Information Sheet, and the Consent Form. The Consent Form will be collected by the designated Institutional Review Office official. The researcher will not have access to the participants name, student ID, or SSN information.

The attached questionnaire asks you about study habits, learning skills and motivation. THERE ARE NO RIGHT OR WRONG ANSWERS TO THIS QUESTIONNAIRE. THIS IS NOT A TEST. We want you to respond to the questionnaire as accurately as possible, reflecting your own attitudes and behaviors in your college life. Please sign below if you would like to be involved in this study. Thank you for your cooperation.

(To be collected by the researcher)

Number_____

Demographic Information Sheet

1. Please write in the name of the class and the class ID code _____

2. Gender (circle one). Male Female

3. What year did you graduate from high school? _____

4. Class level (circle one).
Freshman Sophomore Junior Senior Graduate Student

5. Ethnic background (circle one that best describes which group you identify with as your own).

African-American /or Black

Asian American

Caucasian

Hispanic or/ other Spanish Speaking Group

Native American

International Student

Other

6. What is your present major? _____

7. Did you receive or were you eligible to receive a Federal Pell Grant this semester or any other semester during your time at HOST INSTITUTION? (Circle one).

YES NO

8. Have you ever been eligible or have you ever received a student loan that was partially or wholly subsidized by the Federal Government? (Note: a guaranteed or subsidized federal loan program differs from regular student loans in that the interest of a subsidized loan is paid by the government for the period the student is in school.)

YES No

Number_____

Motivated Strategies for Learning Questionnaire (MSLQ)

Investigator: David Wilson Oklahoma State University/HOST INSTITUTION

(MSLQ cover sheet is to be attached to the MSLQ and collected by the Researcher)

This study in part seeks to better understand several aspects of college teaching and learning. Your scores will potentially give the institution valuable information about typical study habits, learning skills, and motivation required to successfully complete this class. In addition, the researcher will seek to compare information collected from the enclosed demographic sheet and financial aid records to contrast scoring differences than may exist along socio-economic lines. Results from this portion of the study could help us better understand how to tailor future learning environments to fit the needs of future students.

The attached questionnaire asks you about study habits, learning skills and motivation. THERE ARE NO RIGHT OR WRONG ANSWERS TO THIS QUESTIONNAIRE. THIS IS NOT A TEST. We want you to respond to the questionnaire as accurately as possible, reflecting your own attitudes and behaviors in your college life.

VITA

Brian David Wilson

Candidate for the Degree of Doctor of Education

Thesis: CONTEXTUAL STUDENT DIFFERENCES AND SCORING PATTERNS OF THE MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE (MSLQ)

Major Field: Higher Education Administration

Biographical

Education

B.A. History
University of Arkansas, 1994

M.S. Counseling and Student Personnel
Oklahoma State University, 1999

Completed the Requirements for the Doctorate of Education in Higher Education Administration in May 2006

Experience

Academic Coordinator Upward Bound Program
NorthWest Arkansas Community College, 2005 to Present

Director of Student Support Services
St. Gregory's University, 2001-2003

Upward Bound Program Director
Oklahoma State University, 2000-2001

Upward Bound Program Coordinator/ Educational Specialist
Neosho County Community College, 1999-2000

Orientation Instructor, 1997-2000

College of Arts and Science Student Services, Oklahoma State University Graduate Assistant Academic Tutor Mentor, 1997-99, Academic Services for Student Athletes, Oklahoma State University, 1998- 1999.

Professional Memberships

National Association of Student Personnel Administrators (NASPA)
American College Personnel Association (ACPA)
National Academic Advising Association (NACADA)

Name: Brian David Wilson Date of Degree: May, 2006

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: CONTEXTUAL STUDENT DIFFERENCES AND SCORING PATTERNS OF THE MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE (MSLQ)

Pages in Study: 102 Candidate for the Degree of Doctor of Education

Major Field: Higher Education Administration

Scope and Method of Study: The purpose of the study was to first re-establish factorial validity for the MSLQ and assess its predictive strength for low, middle and high income students, and then evaluate if academically successful Motivations and Learning Strategies profiles differ along income and ethnic lines by conducting regression analyses and a multivariate analysis.

Findings and Conclusions: Students from low income families lag behind their upper and middle class counterparts in terms of academic achievement. As more and more of these low income students attend college, the question of how to address the issues faced by these students and aid them in persisting to degree completion takes on a new significance. Substantial research exists, indicating motivation and the use of certain study skills methods may be two likely indicators of student success. The Motivated Strategies for Learning Questionnaire (MSLQ) has been used to attempt to link motivation and the use of certain learning strategies (e.g., study skills) to GPA. However, the instrument had not been used previously to ascertain whether there are significant differences in motivation and the use of certain study skills methodologies among different socioeconomic groups. In this study, the MSLQ was given to a group of students whose socioeconomic status was captured as a part of the study to determine whether the MSLQ is as strong a predictor of academic success, as measured by GPA, for low income students as it is for middle and high income students. This study tested the hypothesis that motivational profiles, and certain study skills methodologies, differ according to the student's socioeconomic status. Although the predictive ability of the MSLQ proved to be weak overall, the results of the study suggest the predictive strength of both the motivation and the learning strategies sections was influenced by a student's economic background. None of the motivation subscales reached significance for the low income group of students. In contrast, the predictability of the instrument increased dramatically for both the middle and high income groups. Although most of the subscales of the learning strategies section did reach significance, the predictive strength to the dependent variable, GPA, was still much less for low income students than it was for middle and high income students Interpretation of the results of the study concluded that confounding variables outside the scope of what the MSLQ were intended to measure were responsible for the loss of predictability of the motivation section for the low income group.

ADVISER'S APPROVAL: Dr. Timothy Pettibone